



Government
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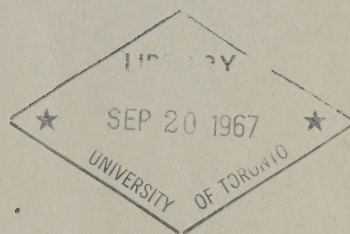
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Government
Publications

GOVERNMENT ACTIVITIES IN THE NORTH

1966



Advisory Committee on Northern Development
Department of Indian Affairs and Northern Development
Ottawa, Ontario

September, 1967

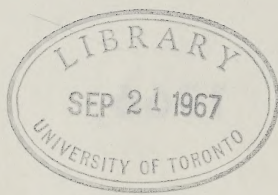
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MEMORANDUM FOR THE ADVISORY COMMITTEE
ON NORTHERN DEVELOPMENT

GOVERNMENT ACTIVITIES IN THE NORTH - 1966


The Advisory Committee on Northern Development was instructed by the Cabinet to report periodically on all phases of development in the Canadian North. This report reviews the activities of the year 1966 and outlines the current plans for 1967.

The report covers the work of the branches and divisions, from twenty-nine federal departments and agencies, active in the Yukon and Northwest Territories, and in some cases includes the northern part of several Canadian provinces bordering on the territories. It is unclassified and copies are distributed on request.

G.W. Rowley,
Secretary.

Advisory Committee on Northern Development,
400 Laurier Ave. West,
Ottawa 4, Ontario, Canada.

September 1, 1967.



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ADVISORY COMMITTEE
ON
NORTHERN DEVELOPMENT

ADVISORY COMMITTEE ON NORTHERN DEVELOPMENT

Responsibilities: To advise the government on questions of policy relating to civilian and military undertakings in northern Canada and to provide for the effective co-ordination of all government activities in that area.

Review of 1966 Operations

The 68th and 69th meetings of the Advisory Committee on Northern Development were held in 1966. A wide variety of reports were made available to the Committee and the most significant report introduced during 1966 was the Report of the Advisory Commission on the Development of Government in the Northwest Territories.

The increased demand for use of Canadian territory for Polar Expeditions resulted in a set of ground rules governing expeditions into the Polar Basin, prepared by a subcommittee of A.C.N.D.

The subcommittee established to examine the potential application of Ground Effect Machines (Hovercraft) in northern areas continued its activities and recommended continued experimentation in this field. The Department of Indian Affairs and Northern Development has taken over the responsibility for chairmanship of this sub-committee.

Other sub-committees of A.C.N.D. are as follows:-

Construction sub-committee under the chairmanship of the Deputy Minister, Department of Public Works.

Grants sub-committee under the chairmanship of the Special Scientific Adviser to the Privy Council.

Northern Telecommunications sub-committee under the chairmanship of the Director, Telecommunications and Electrics Branch, Department of Transport.

Scientific Research sub-committee under the chairmanship of the Special Scientific adviser to the Privy Council.

Transportation sub-committee under the chairmanship of the Deputy Minister of Transport.

The membership of the Advisory Committee on Northern Development was:

The Deputy Minister of Indian Affairs and Northern Development
(Chairman)

Deputy Minister of Agriculture

The Secretary to the Cabinet

Chairman, Canadian Section, Permanent Joint Board on Defence

The Chairman, Chief of Staff

Deputy Minister of Defence Production

Chairman, Defence Research Board

Deputy Minister of Energy, Mines and Resources

The Undersecretary of State for External Affairs

Deputy Minister of Finance

Deputy Minister of Fisheries

Deputy Minister of Manpower and Immigration

Deputy Minister of National Health & Welfare

President, National Research Council

Deputy Minister of Public Works

The Commissioner, Royal Canadian Mounted Police

Deputy Minister of Transport

The Secretary, Treasury Board

The Secretary, Advisory Committee on Northern Development

DEPARTMENT OF AGRICULTURE

DEPARTMENT OF AGRICULTURE

Responsibilities: To investigate the agriculture potential in Northern Canada; through research to determine the possibilities of gardening and farming; to advise other government agencies on matters related to agriculture in the Yukon and Northwest Territories, and other unsettled areas of the North; to conduct botanical and ecological surveys as required; to study the biology, distribution, and systematics of northern insects, plant diseases, and soils.

Long-term Plans

Continue agricultural research on the Experimental Farms at Fort Vermillion, Fort Simpson, and Mile 1019; continue appraisal of agricultural potential in the North on the basis of soil surveys and surveys of native vegetation; collect, identify, and classify insects, fungi, and plants; study agro-climatic relationships on a continuous basis at most centres; provide agricultural data for an overall study of the natural resources of the North.

Review of 1966 Operations

Experimental work was continued on field and garden crops at Mile 1019, Alaska Highway. Experiments included the production of cereal and forage crops under various rotations and fertilizers, and the production of certain vegetables and flowers under natural conditions, in the field using plastic mulches, and in plastic-covered crop shelters. Crops of tomatoes, cucumbers, corn, peppers, beans, celery, etc., were grown successfully to maturity under cheaply constructed crop shelters. Tests were continued on the use of sprinkler irrigation to protect certain crops from early fall frosts. Work was continued on various forages and carrying capacity of native and seeded pasture.

At Fort Simpson experiments were continued with field and garden crops in relation to climatic and soil conditions on the alluvial soil on the island and also on the brown and grey-wooded soils on the mainland along the Liard River.

After suspension of work for one season, experiments were resumed with garden crops at Inuvik. As at Fort Simpson this is in relation to soils and the climate of the area.

A soil capability map was drawn and a report was drafted for publication on the soils in the Upper Mackenzie River area. New colour aerial photographs were secured of a portion of Slave River Lowlands.

Four field parties of entomologists worked in the Arctic and Sub-arctic region: Lake Hazen Camp, Mackenzie and Keewatin Districts, and Peary Land, Greenland. Primarily this was a continuation of distributional records and ecological investigations on insects. Seven papers were published for the series "Studies on Arctic Insects".

In south-western Mackenzie District a botanist collected plants and information for the Northwest Territories flora project. Preparation of manuscript and editing continued on a volume entitled "Arctic adaptations in plants and animals".

Plans for 1967

Agricultural research work will continue at Mile 1019, Fort Simpson, Inuvik, and Fort Vermillion. Emphasis will be placed on the agro-climatic aspects considering climate, plants and soils at various centres.

One botanist will work in the Mackenzie Mountains with a field party from Geological Survey of Canada. This is a continuation of previous work on the N.W.T. flora project.

A mycologist will work at DEW line sites in the Eastern Arctic to collect material for the proposed study of fungi of the Canadian Arctic.

Preparation of reports and soil maps to the scale of 1:20,000 will be continued on Slave River Lowland as soon as additional colour aerial photographs are secured for this specific purpose.

AIR TRANSPORT BOARD

AIR TRANSPORT BOARD

Responsibilities: The licensing of air carriers to operate commercial air services; the economic regulation of air carriers; investigations and surveys relating to the operation and development of commercial air services in Canada and advising the Minister of Transport on matters relating to civil aviation.

Long-term Plans

Normal planning to meet responsibilities.

Review of 1966 Operations

Gap Pine Region contracts were awarded to Wheeler-Northland Airways Limited and Eastern Provincial Airways (1963) Limited as follows for the period July 1, 1966 to June 30, 1967:

Wheeler-Northland Airways Limited

between Frobisher, N.W.T. to Resolution Island.

Eastern Provincial Airways (1963) Limited

between Goose Bay - Cartwright and return
between Goose Bay - Hopedale and return
between Goose Bay - Northwest Point and return
between Goose Bay - Saglek and return
between Goose Bay - St. Anthony and return
between Goose Bay - Stephenville and return

With regard to DEWLine contracts the vertical airlift was awarded to TransAir Limited and the lateral to Nordair Limited.

Supervision and coordination of these contractual arrangements continued.

The Board has continued to deal with applications for additional air services in the North and to provide information on their availability.

Plans for 1967

Normal planning to meet responsibilities.

**CANADIAN BROADCASTING
CORPORATION**

CANADIAN BROADCASTING CORPORATION

Responsibilities: To provide broadcasting services in the North and by means of radio and television programs on the national networks to inform the Canadian public about the North.

Long-term Plans

To extend and improve broadcasting services throughout the North.

Review of 1966 Operations

Labrador and Northern Quebec

Ownership of Radio Station CKVL Schefferville, Quebec, was transferred to the CBC in January. It was connected to the French network as a relay station with a power of 250 watts. In Labrador, construction continued in Happy Valley on the new studios and offices of Radio Station CFGB, Goose Bay.

There was an increase in local program service by Station CFGB, Goose Bay, to the relay stations of the English radio network at Wabush/Labrador City and Schefferville.

The number of recorded television programs in English and French provided by the CBC to the stations of the Iron Ore Company of Canada at Labrador City and Schefferville was increased.

CBC continued to provide recorded English network programs to television station CFLA-TV, Goose Bay.

Northern Ontario

Recorded radio programs from CBC networks were supplied to the radio station operated by DND at Moosonee. The half-hour weekly program INDIAN MAGAZINE produced by CBC Northern Service was included in the program service of the Northern Ontario English radio network of the CBC.

Northern Manitoba

English radio network service was extended to the privately owned radio station at Thompson. Radio Station CHFC, Fort Churchill, was connected to the English national network at the end of October. The community-owned television station at Churchill was provided with recorded English network programs.

Northwest Territories

Network service was extended to Radio Station CHAK, Inuvik, following completion of CNT's landline down the Mackenzie in August. The Mackenzie network with program centre at Yellowknife was extended to include low power relay transmitters (40 watts) at Norman Wells and Pine Point. There are now five communities served by LPRTs of the Mackenzie radio network in the Northwest Territories and one in Saskatchewan at Uranium City. A producer was appointed to Radio Station CFYK, Yellowknife, to extend and improve the local program service of the Mackenzie radio network.

Of the Corporation's radio stations in the North, only CFFB, Frobisher Bay, remains without network connection. Network program service for this station continues to be provided by shortwave and recordings.

Recorded radio and television programs continued to be supplied to military base at Alert.

Yukon Territory

The Corporation's Radio Station CFWH, Whitehorse, was housed in new quarters at the end of March. The Yukon radio network provides a regional program service to nine communities in the Yukon and one in British Columbia at Cassiar by means of LPRTs (low power relay transmitters).

Shortwave Service to the North

There was a slight extension of the daily shortwave broadcasts to the North.

Program Service

Regular broadcasts in Eskimo were introduced by Radio Station CFGB, Goose Bay. Radio Station CFFB, Frobisher Bay, introduced an "open-line" Eskimo broadcast.

Extensive broadcasts were made in the Eskimo and Indian languages as well as in English to acquaint the public with the recommendations of the Advisory Commission on the Development of Government in the Northwest Territories.

Special program highlights during the year included coverage of the by-elections held in the new Northwest Territories' electoral districts particularly that of the Eastern Arctic where the successful candidate, Simonee, had been moderator of CFFB's "open-line" program. The subsequent meeting of the Council of the Northwest Territories at Resolute Bay in October and November was covered in English and Eskimo. Eskimo broadcasts were increased on the shortwave service, as well as on local stations in the North.

In the Mackenzie Delta, the Community Action Program of the Indian-Eskimo Association resulted in a series of broadcasts in the Loucheux Indian dialect. This project was continued in the fall of 1966. Two members of the Company of Young Canadians joined the Indian and Eskimo field-workers in the Delta.

During the year, there was an increase in the production of programs by radio stations in the North for the national networks. Most significant was the one hour radio broadcast featuring Max Ferguson from CHAK, Inuvik, DELTA ON OUR DOORSTEP on November 26 to mark officially the connection of CHAK to the national network. It was carried live by the national CBC radio network, by shortwave to isolated communities in the North, and by trans-Atlantic telephone to the Canadian Armed Forces radio stations in Europe.

Production began on a Centennial series of thirteen colour television programs on the North. The series will attempt to give a comprehensive picture of the Canadian North today.

Television

Experimental work continued in the CBC on the "Frontier Package", an economical television station suitable for the small isolated communities of the North, requiring a minimum of supervision and using long playing video-tape recordings of network programs. Research continued into the use of space satellite systems for the direct transmission of television and radio services to the North.

Plans for 1967

When the Community Action Program of the Indian-Eskimo Association is extended to the Great Slave Lake and Mackenzie areas in 1967, the Mackenzie network expects to broadcast discussions by local Indians.

As a Centennial project, the Northern Service program YOUNG WORLD, originating in Montreal, will be produced at all places where the Northern Service has studios.

A series of talent programs for young people will be sponsored by the Northern Service as a Centennial project.

A series of programs by Farley Mowat on his journey across the Canadian North during the summer of 1966 will be broadcast by the Northern Service and the English radio network, as a Centennial project. A similar series, in Eskimo dialects, prepared by Peter Murdoch who accompanied Mowat will be broadcast by the Northern Service.

In cooperation with the Department of National Defence and with the CBC English and French networks, the CBC Armed Forces Service will send concert parties to military bases in the North.

The Yukon Network will be extended to Clinton Creek. The Mackenzie Network will be extended to Fort Good Hope. Radio Station CFGB, Goose Bay, will move to new studios and offices in Happy Valley, Labrador.

A "Frontier Package" television station will be established in Yellowknife on an experimental basis. If successful, similar stations will be built in other communities in the North.

The colour television series on the North will be broadcast toward the end of the year on the English and French networks.

**CENTRAL MORTGAGE
AND
HOUSING CORPORATION**

CENTRAL MORTGAGE AND HOUSING CORPORATION

Responsibilities: Design of housing, preparation of town development plans, and drafting of planning legislation as requested from time to time by the Department of Indian Affairs and Northern Development.

Financing of housing under the terms of the National Housing Act.

Long-term Plans

The facilities of the National Housing Act and the services of the Corporation will be made available wherever and whenever it is required.

Review of 1966 Operations

Lending Activities

Housing units financed in the North under the National Housing Act totalled 150, considerably more than the 1965 total of 105. Of these, 54 units were in the Yukon Territory and 96 in the Northwest Territory.

The second mortgage plan, provided by the Governments of the Northwest Territories and the Yukon Territory as an addition to amounts available under the National Housing Act, continued in operation. The plan is administered by Central Mortgage and Housing Corporation on behalf of the Territorial Governments. During the past year four such loans were made in the Yukon, bringing the total to 42 since the programme began in 1962.

Other Activities

The Government of the Northwest Territories has requested the Corporation to participate in public housing and land assembly projects at Yellowknife, Hay River, and Inuvik.

At the 1966 Session of the Territorial Council, approval in principle was given to a cost-sharing arrangement for projects (land assembly, public housing, urban renewal) under Section 35 NHA whereby 15% would be

provided by the Territorial Government and 10% by the Municipality. Legislation confirming this formula was presented to the Council at its Session in March 1967, and authority was approved for the Territorial Government to enter into agreements with the Corporation for activities under Section 23, Section 35, Part V and Part VIB of the National Housing Act.

Approval was given in June, 1966 for the investigation of a land assembly project in the Town of Yellowknife. A site has been selected and the Town's consultants are preparing a lot layout and services design. The project will produce about 70 residential building lots. A further site which will eventually provide about 148 lots is also under active development.

In October approval was given for an investigation of a land assembly project at Hay River. Site selection, lot layout, and services design are being prepared for an 83-lot development in a 27-acre area which the Town has acquired from the Territorial Government. The investigation is expected to be completed early in 1967.

Approval was given by the Corporation in December for an investigation for a public Housing project at Hay River. Under the investigation, the need for the project will be reviewed, a suitable site selected, and house designs will be prepared together with estimates of costs, rentals, and subsidies.

In June the Government of the Northwest Territories applied for a loan under Section 35 D of the National Housing Act to construct a three-storey hostel in the Town of Inuvik to house 50 tenants, and a staff of four. Common rooms, kitchen and dining space will be provided. Order in Council approval for the loan has been obtained. The loan commitment to the Territorial Government is subject to negotiation of a rental scale. The Corporation is also assisting the Commissioner to determine what assistance is available under other Government aid programmes to meet operating costs.

At the request of the Department of Indian Affairs and Northern Development a statement was prepared on NHA housing standards in terms of the acceptable minimum relating to size, services, and cost. The purpose of this statement was to make potential home owners in the North more aware of the fact that smaller and cheaper housing than is normal can be build in conformance with Residential Standards and to encourage wider use of NHA loans in northern areas.

In April, the Corporation was authorized to make a grant of \$169,000 under Part V NHA to the Department of Indian Affairs and Northern Development to assist an education program to familiarize Eskimo families with the management and operation of modern housing. The educational program is being carried out in three phases. The first phase is designed to acquaint Eskimos with the basic principles of rental housing. In the second phase, tenants, both men and women, will learn such household skills as the use and maintenance of oil ranges and heaters, proper organization of equipment and furniture etc. The third phase, to run concurrently with the first two, will prepare the Eskimos themselves to administer a housing program for the North in which it is planned to provide some 1,600 homes for needy Eskimo families over the next five years at rent scaled to the families' ability to pay.

In August, the Corporation agreed to make a grant not exceeding \$29,000 to Moody, Moore and Partners of Winnipeg, architects and consulting engineers, for the first phase of a housing study of isolated communities including some Indian communities in Manitoba, Saskatchewan, and Alberta. The study will consist of a survey and the collation of data and interviews to assist the preparation of initial designs of prototype housing appropriate for the communities.

In September five Corporation officials were invited by the Department of Indian Affairs and Northern Development to tour some 12 settlements in the Northwest Territories to familiarize themselves with conditions there. The following month two senior CMHC officers attended a meeting of the Northwest Territories Council at Resolute Bay.

A Co-ordinating Committee with the Department of Indian Affairs and Northern Development was established to determine the manner in which the facilities of the National Housing Act could be utilized in the programmes of the Department.

Plans for 1967

Work will be undertaken as required for the Department of Indian Affairs and Northern Development or for other agencies of the government.

Lending activities will continue at a level determined by the demand for and the supply of mortgage funds.

**CROWN ASSETS DISPOSAL
CORPORATION**

CROWN ASSETS DISPOSAL CORPORATION

Responsibilities: Disposal of Surplus Crown assets declared by Government departments or agencies operating in the North.

Disposal of United States Government owned property located in Northern Canada under the provisions of Canadian Note 140 dated August 28th, 1961 and United States of America Note 52 dated September 1st, 1961.

Long-term Plans

Normal planning to meet requirements for disposal of surplus Government owned assets and special operations based on the changing requirements under certain United States Government operations in the Far North.

Review of 1966 Operations

CADC representatives carried out inspection and disposal of surpluses in the Yukon Territory, District of Mackenzie, District of Keewatin, and District of Franklin. A CADC representative made an inspection tour, by air, of U.S. DEWLine sites located in Canada to study local disposal and transportation problems. Disposal and removal of U.S. surpluses from DEWLine sites were successfully completed without encountering adverse ice conditions.

Plans for 1967

Continuance of normal disposal operations with planning to meet any changes that may develop at DEWLine sites.

DOMINION BUREAU OF STATISTICS

DOMINION BUREAU OF STATISTICS

Responsibilities: Procurement and analysis of statistics for the Yukon Territory and the Northwest Territories and their publication in the regular reports of the Dominion Bureau of Statistics.

Long-term Plans

Normal planning to meet responsibilities.

Review of 1966 Operations

Census

During the year 1966, officials of the Royal Canadian Mounted Police co-operated with the Census (Demography) Division by conducting the field enumeration of the 1966 Censuses of Population and Agriculture in the northern regions of Canada. This participation embraced not only the Northwest Territories (including the Eastern Arctic), but also the northwest corner of the province of British Columbia and the northern portion of the Yukon Territory, as well as the islands in Hudson Bay and James Bay. The Royal Canadian Mounted Police arranged to recruit and use civilian enumerators in specified areas of more concentrated population in the territories covered.

Law enforcement

Statistics are published of cases heard by the Territorial Courts and Police Magistrates' Courts dealing with indictable and summary conviction offences and juvenile delinquency; appeals heard by the Courts of Appeal; the movement of guardroom prisoners; the police statistics of the Royal Canadian Mounted Police; fire crime statistics of the Fire Marshal as reported to the Dominion Bureau of Statistics for the Yukon Territory and Northwest Territories.

Health

Annual Returns of Hospitals were sent to 31 hospitals in the north for the 1966 reporting year - 26 to the Northwest Territories (17 federal, 8 public and 1 private) and 5 to the Yukon Territory (3 federal and 2 public). The distribution of these returns is done through the Territorial Hospital Insurance Service Board. No direct contact is made with any hospital in the north. Data obtained are tabulated and published in a series of Reports - "Hospital

Statistics - Volumes 1-7" (83-210 to 83-216) plus the "Preliminary Annual Report" (83-217).

The Yukon Superintendent reported on a weekly basis all cases of notifiable diseases in his Territory. Weekly reports covering the incidence of communicable diseases in the Northwest Territories were received from the Regional Superintendents of the Northwest Territories. These data were incorporated into the Annual Report of Notifiable Diseases and in the Notifiable Diseases Weekly Summary, both issued by the Dominion Bureau of Statistics.

Hospitals in the Yukon Territory and the Northwest Territories reported information on tubercular patients admitted, readmitted and discharged during the year. Since January 1961, a new system of case notification from the provincial tuberculosis case registers has been in operation in Canada. Also co-operating in the system are the Yukon and the Northwest Territories, but in the absence of a case register, their tuberculosis notification cards are submitted monthly to the Dominion Bureau of Statistics by the Directorate of Indian and Northern Health Services of the Department of National Health and Welfare. Information from the case notification system formed part of the Dominion Bureau of Statistics' Monthly Report, "Incidence of Tuberculosis".

Vital Statistics

Vital statistics tabulations for the Yukon Territory and the Northwest Territories are prepared annually by the Dominion Bureau of Statistics from copies of registrations of birth, stillbirths, marriages and deaths supplied routinely by the Territorial Division of the Department of Indian Affairs and Northern Development and by the Commissioner of the Yukon Territory. Certain of these tabulations are supplied to the two Northern governments or are available on request.

Both the Yukon Territory and Northwest Territories governments are separately represented on the Vital Statistics Council for Canada, which is composed of provincial and territorial officers responsible for the administration of vital statistics and which meets annually to discuss legislative, registration, and statistical matters relating to the vital statistics system.

Education

Since 1955 reports on educational statistics of the same type as used in the provinces have been collected from the public schools of the Yukon Territory through the Superintendent of Schools at Whitehorse.

The same basic reports on teachers and enrolment have been adopted for the schools in the Northwest Territories and these have been collected annually by the Department of Indian Affairs and Northern Development beginning with the school year 1959-60. These reports also include one on promotion and non-promotion of pupils similar to that used for the Indian schools but additional to the report forms used for the public schools of the provinces. The public school and the Roman Catholic separate school at Yellowknife and the Roman Catholic separate school at Hay River report the same as federal schools.

The Department of Indian Affairs and Northern Development provided some information on expenditures on education including the finances of the Public School Board at Yellowknife. The Roman Catholic Separate School Board at Yellowknife reported finances directly to the Education Division.

Expenditures on education by the Territorial Governments of the Yukon Territory and Northwest Territories are extracted from territorial public accounts.

Statistics on elementary and secondary education in the Yukon Territory and Northwest Territories are now being shown in all publications of the Education Division relative to this field.

International Travel

Statistics on international travel movements through ports in the Yukon Territory were published monthly. These international statistics were obtained through customs offices at ports in the Yukon Territory; data on automobile movements were recorded by the Department of National Revenue and compiled by the Dominion Bureau of Statistics, and other travel movements were reported by the Department of Manpower and Immigration.

Personal Income

Personal Income for the Yukon Territory and Northwest Territories is included in "National Accounts, Income and Expenditure." In 1965 it was \$60 million out of \$38,902 million, i.e. about one-sixth of one per cent of Canadian personal income. Revised estimates for 1964 show personal income in the Yukon Territory and Northwest Territories at \$57 Million out of a Canadian total of \$35,153 million.

Industry and Business

Census value added data are available up to 1965 for the individual industries surveyed as part of the Census of Manufactures. Value of production of fishing is available for 1965 as is the revised value of mineral production. However, only the volume of production for logging is available for 1965. Census value added data are also available for the electric power industries for 1965.

The confidential clauses of the Statistics Act preclude publication of statistics by industry and territory except for mining and pipelines. To avoid disclosure, manufacturing and electric power statistics are combined for the Yukon Territory and Northwest Territories and logging statistics with those of British Columbia. In the case of fishing, statistics are published separately for the Yukon Territory and Northwest Territories.

During 1966, the Merchandising and Services Division collected statistics from a sample of retail trade businesses for the purpose of estimating the volume of such business activities. Separate figures are not published for the Yukon Territory and Northwest Territories but are included with British Columbia. A survey of wholesale trade business was under development which will provide data on wholesale activities for the Yukon Territory and Northwest Territories. Statistics were also collected for hotels, power laundries, dry-cleaning plants and motion picture theatres for the purpose of measuring the extent of these business activities. The data are combined with those of British Columbia for publication except in the case of motion picture theatres where figures are published for the Yukon Territory and Northwest Territories.

A Census of Merchandising and Service Establishments was taken for 1966. This is a mail census and results will not be forthcoming until the spring of 1968. The tabulations of data are made to reveal figures for the Yukon Territory and Northwest Territories. The Census surveys all business establishments and locations classified to retail and wholesale trade and the service trades.

During 1966, the Prices Division participated in the Interdepartmental Committee set up to review the Isolated Posts Regulations applicable to Federal Government personnel.

Public Finance

Statistics on actual revenue and expenditure of the territorial governments, included in the Dominion Bureau of Statistics annual report "Provincial

Government Finance - Revenue and Expenditure", and statistics on debt, have been included in the report "Provincial Government Finance - Debt". The data for these reports are obtained from the public accounts of the territorial governments, supplemented by information supplied by territorial treasury officials.

A quarterly statement of revenue and expenditure for the Northwest Territories is received regularly from the Department of Indian Affairs and Northern Development, which is incorporated into the statements of revenue and expenditure of the government sector of the National Accounts. Estimates of similar data for the Yukon Territory, constructed from the annual territory public accounts, are also included in these tables.

Actual financial data on revenues, expenditures, assets, and liabilities of the four incorporated municipalities in the territories are obtained directly from the municipal officials and are included in the annual report "Municipal Government Finance - Revenue and Expenditure, Assets and Liabilities".

Data on territorial revenue from administration of liquor control, on sales of types of alcoholic beverages by value and volume, and on the assets, liabilities, and financial transactions of the territorial liquor authorities are obtained from these authorities and included in the annual reports "Control and Sale of Alcoholic Beverages in Canada" and "Provincial Government Enterprise Finance".

Transportation and Communications

Highway statistics for the Yukon Territory and Northwest Territories were provided by the Departments of National Defence and of Indian Affairs and Northern Development, and the officials of the local municipalities. Also reported by governmental authorities were statistics of motor vehicle registrations, gasoline and diesel oil sales, traffic accidents involving vehicles, and revenues derived from licences and taxes attributable to the operation of motor vehicles. Freight and passenger statistics were supplied by common and contract motor carriers operating within, and in and out of, both the territories. Reports are received from firms engaged in the moving and storage of household goods in and out of the Yukon Territory.

Statistics of railway operations in the Yukon Territory were provided by the White Pass and Yukon Route Railway. Canadian National Railways operations in the Northwest Territories are included in their reports.

Reports of civil aviation were regularly received from over two dozen carriers located in, or servicing, the Yukon Territory and Northwest Territories.

Water Transportation reports were regularly submitted by companies operating cargo vessels on the Mackenzie River system. In addition vessels entering the ports of the Northwest Territories reported particulars of cargoes loaded and unloaded.

Telegraph and cable statistics for the Yukon Territory and Northwest Territories were obtained from the Canadian National Railways in Montreal.

Telephone statistics were provided for the Northwest Territories by the Bell Telephone Company of Canada. Canadian National Telecommunications provided telephone statistics for both the Yukon Territory and Northwest Territories.

Employment

Employment and payrolls of the Government of Canada and its Crown Corporations, for services carried out in the Yukon Territory and Northwest Territories, were covered by reports submitted each month by the responsible departments and corporations and in some cases by means of official documents of the Civil Service Commission, the Treasury Board and the Privy Council.

The government of the Yukon Territory and its Crown Corporation provide monthly statements of their employment and payrolls. The government of the Northwest Territories submits a quarterly statement on staff of the Liquor Commission. Departmental Services of the Northwest Territories' government are performed by employees of the Government of Canada. These employees are reported in statistics for the federal government departments.

Monthly data on employment, payrolls and man-hours were collected from the few larger industrial establishments in the Yukon Territory and Northwest Territories that employ 20 or more persons in any month of the year. Statistics for these areas are not separately published, but are included in the Canada figures in "Employment and Average Weekly Wages and Salaries" and "Man-Hours and Hourly Earnings".

In the new design of the sample frame related to the survey of smaller establishments, there will be separate geographical strata for the Yukon Territory and Northwest Territories. The report, "Estimates of Employees by Province and Industry", however, will include these data in the Canada total only.

Fur

Data were obtained on the numbers and values of pelts taken in the regions for the Fur Season 1965-66. The number of pelts exported from the Northwest Territories and the prices paid to trappers were provided by the Commissioner of the Northwest Territories, Yellowknife, N.W.T. The number of pelts exported from the Yukon Territory and the prices paid to trappers were provided by the Director of Game, Department of Indian Affairs and Northern Development, Yukon Territory.

Plans for 1967

The Vital Statistics annual tabulation program is expected to be computerized in early 1968, for 1967 births, deaths, and marriages. Computerization will not only result in accelerating release of annual data but will also permit tabulation of more detailed data for medical and demographic research. This, in turn, will make possible more intensive studies of trends in fertility, nuptiality, life expectancy, and infant and general mortality, in the general population of the two territories, notably among Indians and Eskimos. The feasibility of computing official life tables for each of the territories, and for both Indians and Eskimos, is also being investigated.

During 1967, the Merchandising and Services Division will collect statistics from a sample of retail trade businesses for the purpose of estimating the volume of such business activities. Estimates will be made of retail business activities carried on in the Yukon Territory and Northwest Territories. A special project will be developed to produce estimates of total retail trade in both territories, for the years 1964, 1965, and 1966. An annual survey of wholesale trade will continue for 1967 and provide data on wholesale activities. Statistics will be collected from hotels, power laundries, dry-cleaning plants, and motion picture theatres for the purpose of measuring the extent of these business activities. The data will be combined with those of British Columbia for publication except in the case of motion picture theatres where figures will be for the Yukon Territory and Northwest Territories.

The Prices Division, in 1967, will continue to participate in the Interdepartmental Committee on Isolated posts, which is studying the regulations applicable to Federal Government personnel. The division expects subsequently to make statistical measurements of comparative living costs at these posts relative to cities in Southern Canada.

A survey on government employment and payrolls in the Yukon Territory and Northwest Territories will begin early in 1967 and continue quarterly thereafter.

During the coming year, discussions are anticipated with Treasury officials of the Northwest Territories to determine the availability of quarterly balance sheet data and with Treasury officials of the Yukon Territory on the availability of quarterly data relating to both balance sheets and revenue and expenditure. If these data are obtained it will facilitate the development of a program of quarterly government finance statistics by the Dominion Bureau of Statistics.

**DEPARTMENT OF ENERGY,
MINES AND RESOURCES**

DEPARTMENT OF ENERGY, MINES AND RESOURCES

INTERDEPARTMENTAL COMMITTEE ON AIR SURVEYS

Responsibilities: To receive from all federal government services requests for air surveys, and to prepare programs of air survey priorities; to issue technical instructions for carrying out such programs, and to co-ordinate the activities of commercial and government air survey organizations.

Long-term Plans

The Yukon Territory, Northwest Territories, and Arctic Islands are now covered with vertical air photography for small scale mapping. Additional mapping photography and photography of special areas for development, scientific investigations and large scale mapping will be provided to meet the annual requirements of federal government departments and agencies.

Review of 1966 Operations

Air survey operations during 1966 were carried out in the north for the various departments as follows:

<u>Department</u>	<u>No. of Areas</u>	<u>Territory</u>	<u>Amount</u>
Energy, Mines & Resources	8	Yukon, Keewatin, Franklin & Mackenzie	\$112,000.
Agriculture	1	Mackenzie	6,500.
Forestry	1	Yukon	5,000.
Indian Affairs & Northern Development	3	Mackenzie, Yukon & Franklin	4,100.
National Defence	2	Yukon & Mackenzie	27,500.
Transport	2	Mackenzie	1,100.
Public Works	1	Yukon	<u>1,700.</u>
Total Expenditures 1966...			\$157,900.

The weather in the Northwest Territories during the past season resulted in good progress throughout the area. However, in the Yukon Territory the weather was less favourable and little progress was made on a large photographic operation there.

Plans for 1967

Plans for air survey operations for 1967 in the north for various departments are as follows:

<u>Department</u>	<u>No. of Areas</u>	<u>Territory</u>	<u>Amount</u>
Energy, Mines & Resources	6	Keewatin, Yukon & Franklin	\$152,100.
Agriculture	2	Mackenzie	17,300.
Forestry	1	Yukon	2,000.
Indian Affairs & Northern Development	1	Mackenzie	19,380.
National Defence	1	Franklin	5,000.
Public Works	1	Yukon	6,100.

Anticipated expenditures 1967...\$201,880.

GEOGRAPHICAL BRANCH

Responsibilities: Obtaining data, through field investigation and compilation, on physical, economic, and social (including urban) geography. Preparing suitable maps and explanatory reports, describing and interpreting these geographical phenomena. Assisting in other phases of planning and development through the provision of fundamental geographical data, including the investigation of questions of geographical nomenclature in the North.

Long-term Plans

To complete preliminary reconnaissance terrain mapping by areas according to the National Topographic System, bearing in mind the constant need for more detailed investigations in areas of economic importance. Prerequisites of this objective include the solution of problems associated with cartographic portrayal of surface conditions and the build-up of skills in detailed air photo interpretation. These problems are being tackled by conducting detailed, long-term field investigations in specific areas, such as Ellef Ringnes, Meighen, and Baffin Islands and the Mackenzie River Basin. Experimentation in precise geomorphological mapping is underway, and the detailed study of problems in physical geography, concentrating on glaciology, hydrology, and landscape evolution, is being undertaken, both as a justified objective in itself, and as a means towards future extrapolation to cover large areas on a reconnaissance basis.

It is envisaged that the base camp established on Baffin Island for a number of years will serve as a centre for such studies. Long-period recording meteorological stations will be established on and near the Barnes Ice Cap. Expansion of the glaciological studies on the ice cap and studies of postglacial isostatic uplift in eastern Ellesmere Island are planned in cooperation with the Polar Continental Shelf Project.

Review of 1966 Operations

Queen Elizabeth Island. Sea-ice studies were continued in co-operation with the Polar Continental Shelf Project.

Mackenzie River Basin. Three staff members continued studies of freeze-up and break-up patterns on the river and its distributary channels in the delta. Heat-energy-budget of streams and lakes was studied and shallow lakes were drained to investigate the changes in permafrost distribution. Additional studies of frozen ground phenomena were also done.

Baffin Island. Twenty-one geographers and assistants participated in addition to four from associated university groups in studies in glacial geomorphology, submarine geomorphology, Pleistocene stratigraphy, glaciology, hydrology, and geology.

Hudson Bay Islands. One party worked on Southampton Island and another on the Ottawa Islands for short periods, studying the glacial geomorphology with special emphasis on postglacial isostatic recovery.

Investigation was completed for 129 new geographical names and 59 contentious names during the processing of 61 new maps or charts and 39 general submissions. Over 4100 previously approved names were reviewed for orthography and application. Names in northern Canada for use in three atlases were reviewed, as well as those appearing in several government publications.

Plans for 1967

The long-range projects in the Mackenzie Basin will continue and additional studies of geomorphology will be started.

On Baffin Island the geomorphological and glaciological studies will be continued while the climatological studies will be greatly expanded. The Geographical Branch will be discontinued, its work being included in the programs of other parts of the Department of Energy, Mines and Resources.

GEOLOGICAL SURVEY OF CANADA

Responsibilities: To describe and interpret by means of appropriate reports and maps, the geology of bedrock and unconsolidated deposits, including those under the continental seas; to investigate and assess mineral resources and the geological factors affecting their formation, discovery, and development; to provide fundamental geological data for engineering and water-supply projects and other factors affecting land use; and to make contributions to the science of geology, including geophysics and geochemistry.

Long-term Plans

Highest priority during the past decade has been given to the preliminary reconnaissance study and mapping of the Yukon Territory and Northwest Territories. About 90 per cent of the north as now been covered on reconnaissance scales (1 inch to 8 miles, and 4 miles). Only two major gaps in coverage remain, an area in District of Mackenzie south, west, and northwest of Great Bear Lake, and the central part of Baffin Island; smaller areas yet to be covered include Southampton and Coats Islands, the northern tip of Melville Peninsula, the eastern third of Devon Island, and several scattered areas in Yukon Territory. The effort devoted to this work will now decline gradually until its completion several years hence. This reconnaissance has gone far towards meeting the immediate demands of the mining and petroleum industries for general information on remote areas, and permits preliminary estimates of mineral potentials.

The effort devoted to the detailed study of critical areas and problems disclosed by the reconnaissance work, and to investigations of mineral areas, has increased steadily during the last few years, particularly in the Yukon Territory and the Districts of Mackenzie and Keewatin.

Aeromagnetic surveys made by or for the Geological Survey are primarily a supplementary method of obtaining reconnaissance geological data. As a result of an \$18 million cooperative program of aeromagnetic surveying started in 1961, it is expected that an aeromagnetic survey of the Canadian Shield in the Northwest Territories, and currently amenable parts of the Yukon, will be completed within about a decade. The surveys are being

made by contracts with commercial survey companies. Experimental surveys undertaken in British Columbia in 1964 and 1965 have led to the development of practicable and reasonably economical ways of making detailed aeromagnetic surveys of mountainous terrain and thus make additional areas of the Yukon Territory amenable to these surveys.

The 8-mile geological reconnaissance of the District of Franklin north and west of Baffin Island was completed by the end of the 1964 field season. Helicopter-supported reconnaissance surveys of the northwest and southeast parts of Baffin Island have been completed and two other such projects will follow, with the object of completing the initial survey of the island, and the District of Franklin, within the next few years.

As a follow-up to the initial 8-mile reconnaissance, the 2-mile mapping and study of Bathurst and the adjacent islands started in 1963, will be continued by similar investigations of other critical areas and by stratigraphic-palaeontological studies required to solve specific problems. Aeromagnetic surveys will keep pace with the Polar Continental Shelf Project as the centre of that effort moves southwesterly from Isachsen. It is unlikely that the general level of Geological Survey activity in the Arctic Islands, except Baffin Island, will increase significantly in the next few years.

The Geological Survey is currently engaged in the development of several techniques that may have important applications to mineral exploration in the north. These include airborne gamma-ray spectrometry, infra-red remote sensing, colour photography, and geochemistry.

The opening in 1967 of the Institute of Sedimentary and Petroleum Geology in Calgary, with its modern building and laboratories, provides a broad base for geological investigations in the Mackenzie River region and in sedimentary basins of the Arctic Islands.

Review of 1966 Operations

Thirteen parties spent the entire field season in Yukon Territory or Northwest Territories, and six others spent part of the season. The results of their work have been outlined in Geological Survey of Canada Paper 67-1, Part A, released 7 February, 1967.

In the District of Franklin, Operation Grant Land, supported by one helicopter and two fixed-wing aircraft completed a two-year project of reconnaissance and stratigraphic investigation of some 40,000 square miles of northern Ellesmere Island. Five staff geologists and one associate from the Greenland Geological Survey concentrated on different aspects of

the geology, including a northern coastal belt of 'basement' rocks, a complex geosynclinal belt (Franklinian geosyncline) of late Precambrian and lower Palaeozoic sedimentary and volcanic rocks, a mountain belt of folded basinal rocks (Sverdrup Basin) of Permo-Carboniferous to Cretaceous age, and scattered small areas of continental Tertiary clastic beds. The work in Greenland was designed to relate geological formations and structural features across the narrow body of water separating northeastern Ellesmere Island and northwestern Greenland (Hall Land). Another party spent two weeks, with logistic support from the Polar Continental Shelf Project, in further investigations of the Winter Harbour moraine on Melville Island. This moraine marks a segment of the northwest margin of the Laurentide (continental) ice-sheet and probably was formed at the maximum stand of the ice-sheet during the last (Classical Wisconsin) glaciation.

In parts of the Districts of Franklin, Mackenzie, and Keewatin one party completed the sampling and examination of the major diabase dyke swarms of the Western Canadian Shield. It is expected that completion of laboratory work will result in significant advance in our knowledge of the correlation of the widespread unmetamorphosed basic rocks of the Shield.

In the District of Keewatin one party carried out a study of some 15,000 square miles of the northeastern end of the Rankin Inlet - Ennadai Lake orogenic belt, directed toward geological, operational, and logistical problems for future investigations in this potentially favorable mineral region. This party also reported on a pyritic quartz-pebble conglomerate of the Hurwitz Group that may have economic significance, due to its similarity to pebble conglomerates in the Elliot Lake area of Ontario. Another associated party undertook an initial examination of the plutonic rocks of the region to determine their nature and relationships between individual plutonic masses, and to select areas of extensively outcrop that are suitable for more detailed studies. These projects and their future continuance follow from wide-ranging reconnaissance by helicopter of Operations Keewatin (1952) and Baker (1954).

In the Districts of Keewatin and Mackenzie one party completed a stratigraphic and petrologic study of the Dubawnt Group begun in 1963 with the purpose of determining the internal make-up of this group of flat-lying sediments and volcanic rocks of Proterozoic age. A brief survey of eskers in the Dubawnt River - Thelon River region was carried out by another party to supplement earlier observations by helicopter reconnaissance. This work was designed to provide data in planning more detailed studies.

In the District of Mackenzie one party completed a three-year program of regional studies in the gold-bearing rocks of the Yellowknife Group in the Contwoyto Lake area. Another party spent two weeks completing investigations of the stratigraphy and structure of Proterozoic sediments in the Rocknest Lake area, the need for which was disclosed by Operation Coppermine in

1959. A third party commenced and completed work on the Coppermine River basaltic flows as a further phase of the study of volcanic rocks in the Canadian Shield. Five profiles were mapped across the Coppermine River Group and the lava flows along these were sampled at intervals of about 200 stratigraphic feet. The samples will be analysed for major and minor elements. Copper, mainly in the forms of chalcocite, bornite, and native metal, was found in a variety of environments and places. In the East Arm of Great Slave Lake a party under a Ph.D. candidate commenced a project on the stratigraphy, sedimentology, and tectonics of Proterozoic rocks. This project demonstrated the practicality of intra-basin correlation by fossil algal forms, which may well prove to be a valuable new tool in studies of late Precambrian sediments. Another party spent two weeks examining similar algal forms in the Rocknest Lake area as a preliminary step to assessing their use in inter-basin correlations. South of the East Arm of Great Slave Lake a party continued investigations of the paragenetic and structural history of migmatitic, metamorphic, and mylonitic gneisses. The pattern and movement along major faults in the area and their economic significance are included in this study. In the Pine Point area one party spent part of the field season on studies of the geochemistry of the lead-zinc deposits in carbonate rocks. And one party spent part of the field season investigating the Quaternary stratigraphy and glacial history of the Mackenzie delta region and adjacent Arctic coast.

In the District of Mackenzie and Yukon Territory one party spent part of the season investigating the tectonic significance of the changes in structural trend among the mountain ranges of the northern Cordillera. Many samples were collected for palaeomagnetic, radiometric, and petrographic studies. Another, helicopter-supported, party (Operation Selwyn, 1966) continued reconnaissance mapping and study of the stratigraphy and structure of the Selwyn Mountains.

In the Yukon Territory one party continued engineering geology studies carried out at the request of the Water Resources Branch. Two storage dam sites on Lapie River and one on Ross River were examined. Another party commenced mapping of surficial deposits and a study of Pleistocene stratigraphy of Aishihik Lake map-area. An associated party continued investigations devoted to the establishment of a Pleistocene chronology and development of a technique for meaningful quantitative description of glacial moraines in the Snag-Kluane Lake region of southwestern Yukon. A fourth party spent part of the field season on a metallogenic study of the beryllium-tin province of the Cassiar batholith in Yukon and northern British Columbia. The region is noted for the number and variety of its mineral occurrences.

Aeromagnetic Surveys covered: in the District of Franklin 5,000 square miles from Prince Patrick Island over the Polar Continental Shelf to the northwest, and some 11,000 square miles of north-central Baffin Island between 69 and 73 degrees; in the District of Mackenzie about 13,000 square miles of the barren grounds northeast of Artillery Lake between 63 and 66 degrees; and in the Yukon Territory about 10,000 square miles along the Alaskan border between 61 and 65 degrees.

Plans for 1967

Fifteen full-season and two part-season field parties are planned for the Yukon and Northwest Territories. Six parties will be in the District of Franklin, three in the District of Keewatin, three in the District of Mackenzie, two in the Yukon Territory, and three will operate in more than one of the Territories, Districts, or Provinces. Three aero-magnetic surveys will be carried out under contract.

In the District of Franklin one party will commence geological reconnaissance and structural studies in Grinnell Peninsula and northwestern Devon Island, a potential oil and gas region. Another party will commence and complete investigations into Carboniferous and Permian stratigraphy in the Parry Islands. One geologist will spend one month preparing for a three-year project on stratigraphic and structural mapping of Phanerozoic rocks in northeastern Baffin Island, Foxe Basin, and Melville Peninsula. A fourth party will commence a two-year project on the stratigraphy and structure in Cretaceous and Jurassic rocks in the Ringnes Islands, a potential oil and gas area within the Sverdrup Basin. A specialist will study glacial history, surficial geology, and glacial margin variations in northeastern Devon Island, and in part of the field season will complete the surficial geology of southern Baffin Island initiated by Operation Amadjuak (1965). Another party, continuing high sensitivity aeromagnetic surveys in cooperation with the National Aeronautical Establishment, will spend part of the season in northern Baffin Bay.

In the District of Keewatin two coordinated parties will continue studies of volcanic-sedimentary assemblages, granitic rocks and their tectonic settings, and economic geology in the northern part of the Ennadai orogenic belt. Another party will investigate the extension of Hurwitz sedimentary rocks into the southern part of this belt. All three are part of a major, multi-disciplinary project planned for this economically interesting region over the next several years.

In the Districts of Keewatin and Mackenzie a party will carry out reconnaissance and detailed investigation and mapping of well-exposed eskers to determine their classification, form, sedimentology, origin, and relation to nearby overburden and bedrock. This fundamental information may be applicable to mineral exploration.

In the District of Mackenzie one party will study petrology and metamorphism across the northern end of the Thelon Front, east of Bathurst Inlet. The Thelon Front is a major "break" separating the Slave and Churchill tectonic provinces. The region has had a long and complex history, and it would be surprising if no economic mineral deposits were present in or near it. Another party will complete its investigation, as a doctoral thesis project, of the stratigraphy, sedimentology, and tectonics of the Proterozoic basin in the East Arm of Great Slave Lake. A third party will continue the study of the Nonacho Group of sedimentary rocks and its regional setting east of Great Slave Lake.

In the southwestern District of Mackenzie and southeastern Yukon Territory Operation Selwyn, a three-year project, will be completed. This comprises a systematic investigation of the geology in southern Selwyn Mountains, Hyland Plateau, and Cassiar Mountains of the northern Cordillera. This major project is supported by extensive use of helicopters. One officer will spend part of the field season at Whitehorse and Yellowknife gathering data for the Metallogenic Map of Canada.

In the Yukon Territory one party will study the stratigraphy and geomorphology of glaciated and adjoining unglaciated areas in the Aishihik region, and altiplanation terraces and other mass-wasting features near Dawson. An associated party will complete investigations of surficial geology from the present glacier to the glacial limit in the Kluane Lake and Snag areas as a doctoral thesis project. The Resident Geologist (Whitehorse) and probably another officer will examine various mineral deposits under exploration, including those of the Ross River-Vangorda camp.

Aeromagnetic Surveys will cover: in the District of Franklin 5,000 square miles from Prince Patrick Island over the Polar Continental Shelf to the northwest and west, and some 23,000 square miles of north-central Baffin Island between 69 and 73 degrees; in the District of Mackenzie about 23,000 square miles astride Bathurst Inlet between 66 and 68 degrees; and in eastern Yukon Territory about 12,000 square miles between 62 and 64 degrees. This last project will complete the aeromagnetic coverage of most of the southern half of the Territory.

MARINE SCIENCES BRANCH

Responsibilities: To carry out hydrographic and oceanographic surveys in Arctic waters.

To produce and distribute charts, sailing directions, tide tables, and reports based on survey activities and on information from all sources.

To carry out research on the oceanography of the region.

Long-term Plans

To complete standard hydrographic surveys of the Arctic coast as soon as possible, and to continue the publication and maintenance of up-to-date charts of the region. To carry out reconnaissance surveys where requirements exist for charting ahead of the regular surveys. To maintain reliable sailing directions as published in the Pilot of Arctic Canada. To establish and maintain a network of gauging stations to meet the needs of scientific research. To carry out oceanographic and current surveys to meet general scientific requirements including those of defence. To improve steadily the capability to carry out fundamental research on Arctic oceanography and the means to conduct observations in the region.

Review of 1966 Operations

Oceanography

- (1) Geophysical and geological surveys of Ungava Bay, Baffin Bay, Labrador Sea; magnetic survey and sparker survey; this work was carried out by three oceanographers over a three month period. Geological sampling in the Eastern Arctic was carried out by two oceanographers over a two month period. Frozen Sea Research Group - research into the basic physics of formation and decay of ice in Cambridge Bay was carried out by four oceanographers and technicians over a two month period.

Hydrography

(1) Eastern Arctic

Two hydrographers plus casual labour conducted surveys in Milne Inlet, Resolute, and Jones Sound. Field time was four months.

(2) Western Arctic

While waiting for the ice to clear from Tuktoyaktuk helicopters were used to extend control around the perimeter of the Mackenzie Delta. A new survey was made by CSS Richardson of the eastern entrance to Tuktoyaktuk. Heavy ice in the Franklin Bay area frustrated attempts to reach Holman. As an alternative track soundings were made in Liverpool and Mackenzie Bays before Richardson headed for Victoria, B.C., for an extensive refit after wintering for four years in the Western Arctic. Two hydrographers joined CCGS Camsell off Tuktoyaktuk at the end of July. Camsell was kept busy escorting ships through the heavy ice for the first three weeks but some soundings were obtained at Paulatuk and off Cape Parry. Good progress was made on the survey of Spence Bay. The opportunity was then taken of unusually favourable ice conditions to explore Larsen Sound and Victoria Strait, the first time these waters had been travelled since 1846 when Franklin's ships were frozen in.

(3) Polar Continental Shelf Project

Four hydrographers carried out a reconnaissance survey off Prince Patrick Island and in Heila and Griper Bay. Considerable experience was gained, but little progress made, in the survey of the Lincoln Sea due to difficulties which were encountered in the propagation of radio waves, at the frequencies used by Hi-fix, over the very rough ice in the area.

(4) Tide Gauges

A new gauge was installed at Cape Parry. Unfortunately the gauges at Frobisher and Alert were damaged during the year. A reconnaissance of possible gauge sites at Cape Dyer and Hall Beach was carried out by one hydrographer.

(5) Charts

Two new provisions charts, eleven new editions, three corrected reprints, and four supplementary prints were issued of Arctic Charts.

Plans for 1967

Marine Geology

A program of service work will be carried out over a period of six weeks in Hudson Bay.

Hydrography

(1) Eastern Arctic

Hydrographers will be assigned to Canadian Coast Guard ice-breakers. The program will include reconnaissance surveys in Eureka Channel, Bauman Fiord, and the fiords and continental shelf off the East Coast of Baffin Island.

(2) Western Arctic

The main project of CSS Richardson will be a survey of Sachs Harbour and its approaches. If time permits surveys will also be made of Kanakuk Beach, the shoal area off Cape Dalhousie, and eastwards from Kugmallit Bay. Before joining CCGS Camsell, two hydrographers will extend a tellurometer traverse along the Yukon Coast and start sounding Kittigazuit Bay. The main work from Camsell will be at Coppermine, Perry Island, and Spence Bay.

(3) Polar Continental Shelf Project

Hydrographers will extend the reconnaissance survey of the Continental Shelf off Prince Patrick Island and use LAMBDA for the survey of the Lincoln Sea.

(4) Charts

Advanced prints of three new charts, covering Milne Inlet, St. Roch and Rasmussen Basins, and Spence Bay will be issued with about nine new editions. Two new bathymetric sheets of the Arctic Ocean from 0° 180° W, north of 72° N., will be issued, based upon the compilations prepared for the General Bathymetric Chart of the Oceans and will show soundings and bathymetric contours in metres.

(5) Publications

New supplements will be issued to volumes two and three of the Pilot of Arctic Canada. A new edition of volume three will be published late in the year. The format of Canadian Tide Tables has been completely revised for 1967 and predictions for the Arctic and Hudson Bay are now given in volume four of the Canadian Tide and Current Tables.

MINES BRANCH

Responsibilities: Technical assistance for the development of mining and metallurgical industries in the North and for the development and utilization of petroleum and natural gas resources. Consulting advice and investigations on metals, metallic and non-metallic minerals, fuels, petroleum, and natural gas as related to northern development.

Long-term Plans

To continue technical assistance in developing mineral, petroleum, and natural gas resources in co-operation with industry, the Department of Indian Affairs and Northern Development, and other branches of government.

Review of 1966 Operations

Metallic Ores

The investigation of an iron ore from the Crest Exploration Limited property in northern Yukon Territory was continued. A two-ton sample that had been preconcentrated by mechanical sorting was concentrated by jigging to marketable grades. Samples of concentrates were shipped to potential iron ore users for evaluation of their smelting properties. The branch is continuing its interest in this project.

An investigation is nearing completion on a high grade gold-silver ore from the Carmacks area, Yukon Territory. Cyanidation succeeded in recovering about 82 per cent of the precious metal values. Although the cyanide residue contains appreciable gold and silver, attempts at recovery by flotation so far have had limited success.

The investigation of a sample of ore from the Marian River area of Northwest Territories was completed. Although the cobalt minerals in the sample were not amenable to concentration, a process was developed for recovering appreciable bismuth and gold.

A sample from the Pine Point area contained 3.5% lead and 11.6% zinc. On investigation, 85 per cent of the lead and 82 per cent of the zinc were recovered in separate concentrates grading 60% lead and 55% zinc. The investigation is continuing to improve the metallurgy.

Late in the year an investigation was started on a lead-zinc ore containing appreciable gold and silver from the Homer Lake area, N.W.T. Preliminary studies show the ore to be fairly complex. Work will be continued in 1967 to develop a suitable flowsheet.

Extraction Metallurgy

Canada's only tungsten producer is located in the Northwest Territories, and the ore treatment processes of the mine are designed to produce a high grade scheelite concentrate by conventional physical concentration methods. In view of the normally competitive nature of the tungsten market, the Mines Branch earlier instituted a research program on processes for the production of high purity tungsten products using some of the more recently developed hydrometallurgical techniques. A leaching-refining process employing ion exchange to remove unwanted elements from tungsten leach solutions was developed, and during 1966 a small pilot plant was assembled and operated to investigate the leach process on a continuous basis. The process should offer a route to treat lower grade tungsten concentrates to yield high purity products at competitive costs.

The following Northwest Territories gold mines were visited by a Mines Branch specialist in gold metallurgy:

Giant Yellowknife Mines Ltd.
Consolidated Mining and Smelting Company of
Canada Limited - Con, Rycon and Vol Mines.
Discovery Mines Ltd.
Tundra Gold Mines Ltd.

The Mines Branch representative discussed operating problems with the managers and mill superintendents of the operating mines, and was able to make a number of suggestions.

As in previous years, the facilities of the Mines Branch were made available for the Annual Meeting of the Canadian Gold Metallurgists, at which technical and operating experience relating to gold milling in Canada is exchanged among gold mill superintendents, and between the gold mill superintendents and Mines Branch staff.

The Mines Branch earlier assisted in studies on the application of automated control to gold mine grinding circuits. The results of these studies facilitated the installation and operation of similar controls at a Northwest Territories gold mines in 1966.

Fuels

Further investigations were carried out on samples from the Tantalus Butte and old Tantalus Mines, as well as from Ross River, Y.T. - all directed to determine if coal from these locations could be made into coke for metallurgical use. A coal cleaning study was carried out to ascertain if reduction of ash would improve the coal quality for coke making, but a negative result was obtained.

Seven mine air samples from Elsa Mine, Y.T., were analyzed together with a contaminated air sample from Whitehorse.

The characterization work on the physical and chemical properties of the Melville Island tar sand samples supplied by the Geological Survey has been completed, and the results were included in the Geological Survey of Canada paper 66-34 entitled "Lower Triassic Tar Sands of Northwestern Melville Island, Arctic Archipelago" by H.P. Trettin and L.V. Hills.

Mineralogical Examinations

Mineralogical studies were made of several base-metal ore samples from the Pine Point area of N.W.T., submitted by Pyramid Mines Limited. Mill products resulting from the beneficiation of this ore, of iron ore from Crest Explorations, and of bismuth ore from the WES property were also examined and evaluated. In addition, an appraisal was made of a sample of iron ore from Pond Inlet on Baffin Island, submitted through the Department of Indian Affairs and Northern Development.

Thermoanalytical Tests

Thermoanalytical tests (differential thermogravimetric analyses) were conducted on a clay sample from Stanwell Fletcher Lake, N.W.T., on behalf of a member of the faculty of the Geology Department of the University of Ottawa, in order to assist him in certain of his studies.

Chemical Analyses

Chemical analyses were made on 40 samples for a total of 79 determinations. Of these, 39 samples and 78 determinations were from Keewatin and Melville Peninsula, N.W.T. (received from the Geological Survey of Canada); 1 sample and 1 determination were from Yellowknife, N.W.T. (received also from the Geological Survey of Canada).

The Use of Carbon Steels and Low-Alloy Steels at Low Temperatures

Hull plates, often made from rimming steel, taken from bulk carriers manufactured in the period 1875-1945, in use on the Great Lakes, have been subjected to metallurgical examination and preliminary recommendations have been made concerning maintenance and safety of the vessels under winter conditions.

Studies are being made aimed at improving the resistance to brittle failure in various steels used in the cast condition by means of variations in chemical composition and casting practice. These steels include a nickel-vanadium steel for ice-breaker propellers, a general purpose high-strength low-alloy steel, and an ultra-high-strength 9% nickel steel.

A new copper-nickel steel developed by the Physical Metallurgy Division has been tested. In the wrought form, the steel can be heat-treated to a high strength of 160,000 psi, though retaining satisfactory resistance to brittle failure to temperatures as low as -100°F. Tests have shown that the steel has good weldability compared with other steels of similar strength.

A fundamental study of the brittle failure mechanism is in progress with particular reference to the metallurgical structure and the stress-strain field in the vicinity of the tip of an advancing crack. In addition, as a natural extension of the work done previously to investigate cracking difficulties associated with welding at low ambient temperatures, the basic factors responsible for cracking in one of the weldability tests used for the low-temperature work are being systematically examined.

Plans for 1967

Galvanizing offers important potential savings by eliminating maintenance for bridges and similar structures. However, some embrittlement may arise from acid-pickling before galvanizing. The extent to which this problem may be complicated by welding is not fully known. A limited exploratory program is planned, because of the importance of avoiding the aggravation of the brittle failure problem.

The development of new steels and the improvement of existing steels designed to resist brittle failure will be continued.

Technical and scientific services will be provided for assisting in the opening of new mines, for increasing mineral production in the Territories, and for solving production problems of petroleum and natural gas. Scientific advice will be available and investigations will be undertaken as required on northern problems related to metals, minerals, fuels, petroleum, and natural gas.

OBSERVATORIES BRANCH

SEISMOLOGY DIVISION

Responsibilities: The Division of Seismology operates seismic observatories at Alert, Mould Bay, Resolute, Coppermine, Frobisher, Yellowknife, Baker Lake, Great Whale River and Schefferville, and a large seismic array near Yellowknife. Research is conducted on earthquakes recorded in the Canadian north. In cooperation with the Polar Continental Shelf Project, crustal seismic refraction studies are undertaken. Geothermal research is carried out through the Canadian north.

Long-term Plans

The Division of Seismology is constructing a first-order seismograph station at Churchill. It is intended to construct a similar station at Inuvik at some time in the future, and a second-order station for local seismicity studies at Whitehorse. Studies of the crust and upper mantle in the Canadian Arctic will be continued as well as geothermal research in boreholes abandoned by oil companies.

Review of 1966 Operations

The seismic stations and the seismic array operated continually. Construction commenced on a new station at Churchill. A major crustal experiment was conducted in and around Yellowknife: 11 field parties recorded the seismic signals from 17 shots in widely dispersed locations. The results were also used to calibrate the crust under the Yellowknife Array.

Geothermal measurements were made on Richards Island, and in the interior of the Yukon Territory, using holes abandoned by all companies.

Plans for 1967

The seismological observatory program will be continued and the vault at Churchill instrumented. Geothermal research is planned on a continuing basis in the Mackenzie District and Yukon Territory.

GEOMAGNETIC DIVISION

Responsibilities: The Geomagnetic Division measures and charts the magnetic field, operates a network of magnetic observatories, and conducts research into the structure of the crust by geomagnetic methods.

Long-term Plans

To reoccupy magnetic repeat stations at 3 to 5 year intervals; to carry out three-component airborne magnetic surveys at 5 to 10 year intervals; to operate permanent and temporary magnetic observatories.

Review of 1966 Operations

Poor flying weather severely curtailed field operations in the Queen Elizabeth Islands. Two magnetic stations were occupied to determine the secular change of the geomagnetic field. Only 5 days of records were obtained with portable magnetotelluric equipment on Cornwallis Island. Magnetic observatories operated continuously at Alert, Mould Bay, Resolute, and Baker Lake. Two new non-magnetic buildings were erected at Resolute.

Plans for 1967

Five temporary magnetotelluric stations will be set up in Ellesmere Island east of Lake Hazen, to study an anomaly in magnetic induction in the earth's crust. Special magnetotelluric recordings will be made at Alert. The four magnetic observatories will continue in operation, and a program of micropulsation studies will be started at three of them. A new non-magnetic building will be constructed at Baker Lake.

GRAVITY DIVISION

Responsibilities: The Gravity Division obtains gravity data for use in geodetic research problems and for studies of regional as well as localized crustal features. Gravity data is used in geodetic research to assist in determining the size and shape of the earth and is currently of interest to the Department of National Defence in connection with the problem of long range rocket and missile trajectories. Gravity data with interpretations is provided as a service to the oil and mining exploration industries.

Long-term Plans

Within the next decade, regional gravity coverage at a station spacing of 6 to 8 miles should be completed over most of the northern area of Canada including the inter-island channels of the Arctic Archipelago and a large part of the Polar Continental Shelf. Where possible, local anomalous areas will be investigated in detail. For the most part, the analysis and interpretation of the data obtained from the regional surveys will be presented as preliminary reports accompanying issues of the Gravity Map Series of the Dominion Observatory.

Review of 1966 Operations

1. District of Mackenzie. From May 15 to Sept. 1 a twelve man party from the Dominion Observatory observed 4700 gravity stations at 8-mile intervals over an area of 250,000 square miles between latitude 62° and 70° north and longitude 102° and 120° west. In order to map the gravity field over the Bear and the Slave geological provinces and to extend gravity coverage in the area of the Coppermine gravity high, detailed traverses were done over the contact between the two geological provinces and over the meta-volcanics of the Yellowknife group. Over twenty-five hundred density determinations were made on all rock types in the survey area.

2. Arctic Islands. With the cooperation of the Polar Continental Shelf Project, gravity coverage was extended. Three traverses more than two hundred miles in length were completed from Prince Patrick Island over the continental slope and shelf to the Canada Basin. In addition 372 regional stations were established over sea ice north and west of Melville Island. A party completed 140 regional stations in the vicinity of Alert on Ellesmere Island, and established 662 stations on northern Baffin Island.

3. Application to glaciology. Efforts were continued to determine if repeated gravity measurements can be used to calculate long period fluctuations in the elevation of ice caps. The relative position of the 14 aluminum poles across the crest of the Penny Ice Cap were re-surveyed, the gravity differences between the poles and "Gravity Base" were remeasured, and the gravity change along the direction of movement of the centre pole was observed. Other observations included stratigraphic snow analysis, density and temperature measurements at the centre station. Movement and ablation measurements were made at one outlet glacier.

Plans for 1967

Polar Continental Shelf. A regional gravity survey will be conducted over the shelf area off Prince Patrick Island and two traverses out beyond the edge of the shelf are scheduled. Regional gravity measurements will be made over the Lincoln Sea.

POLAR CONTINENTAL SHELF PROJECT

Responsibilities: To carry out a long-term investigation of the continental shelf lying to the north and west of the Canadian Arctic Archipelago and of the waters above it, together with the islands of the archipelago where relevant, and the straits and sounds between the islands. The investigation is to comprise mainly those fields of survey and subjects of research for which the Department of Energy, Mines and Resources is responsible in other parts of Canada, wherever such study is not more economically and efficiently pursued as a separate self-contained operation; but it is also designed to include or to support worthwhile researches in fields outside those normally supported by the Department, if such researches could not otherwise be carried out. Emphasis is placed on field research and on survey, but basic laboratory or theoretical research is carried on as needed to aid in the investigations, or in the interpretation of field data; and equipment or technique development or experimentation is undertaken as relevant. In addition, the facilities of the Project are made available, under certain conditions, to approved university and other non-Government research groups.

Long-term Plans

The field survey and research phases will eventually cover all the Canadian sector of the Arctic continental shelf of North America, those parts of the Arctic Ocean basin that are of interest to Canadian investigators and which can be reached with available logistics resources, and all parts of the Arctic Archipelago not investigated by other agencies in the particular fields of interest covered by the Project. From 1959 to 1966 work has been concentrated in the region between Meighen Island and M'Clure Strait, extending about 250 kilometres out to sea and the same distance back into the archipelago; but individual programmes of survey and research have been carried out throughout all the Queen Elizabeth Islands, and extended to the Beaufort Sea in the southwest and northern Greenland in the northeast.

Review of 1966 Operations

Field work was co-ordinated mainly from Mould Bay, on Prince Patrick Island, and from Alert, Ellesmere Island. Parties totalling 107 persons were engaged in investigating the central section of the arctic continental shelf and the adjacent islands and straits, and the region of Robeson Channel and Lincoln Sea. Other work ranged over northwestern Baffin Island, Victoria Island, and Melville Island. Supporting activities connected with transport engaged about thirty people in addition to those directly on the field operation.

In addition to the Department of Energy, Mines and Resources, the following agencies were involved in the 1966 programme of the Polar Continental Shelf Project:

National Research Council
Department of National Defence (Defence Research Board)
(Royal Canadian Navy)
Carleton University
Dartmouth College
University of Liege (Belgium)
McGill University
University of Ottawa
Arctic Institute of North America
Australian National Antarctic Research Expeditions

One commercial company, Petropar Canada Limited, also took part in some of the Polar Continental Shelf Project field operations, under an approved arrangement, in connection with its own programme of investigations.

The following is a summary of the work done in the major scientific fields:

Aeromagnetic Surveys

Measurements of the total residual magnetic field as recorded from a height of 1,000 feet above the surface were made over the continental shelf and continental slope, southern Prince Patrick Island, Fitzwilliam Strait, Crozier Channel, and Eglinton Island. Poor environmental conditions and equipment difficulties severely reduced the amount of survey, but about ten thousand line miles were flown to acceptable standard.

Geology, Marine

The programme in submarine geology has been designed to provide information on the character and stratigraphy of the sediments on the floor of the seas surrounding the islands of the archipelago, and covering from the continental shelf and continental slope offshore from northern Prince Patrick Island and from Hecla and Griper Bay, north of Melville Island, and studied in the laboratory for evidence of their age, source, conditions of transport and sedimentation, and indications of change in sea level and variations in climate in the geologically recent past.

Geology, Terrestrial

Certain logistic support and field facilities was provided to parties of the Geological Survey in northern Ellesmere Island and north-western Greenland and on Melville Island; to a party from Dartmouth College studying the late Precambrian rocks on Victoria Island; to geologists from the University of Ottawa carrying out various geological investigations on Somerset Island, Ellesmere Island, Prince Patrick Island, and Victoria Island; and to studies, sponsored by Carleton University and the Arctic Institute of North America, of the geology in the vicinity of Arctic seismological stations.

Geomagnetism

Field tests were continued near Resolute of newly-developed transistorized geomagnetic and magneto-telluric equipment.

Glacier Physics and Glaciology

Temperature and closure measurements were made in the borehole that penetrates the Meighen Icecap. Routine glaciological measurements were continued on the Meighen and Melville Island icecaps. Survey control and markers were prepared, and the contract let for low-altitude aerial photography of the Melville Island icecaps, but due to poor weather the snow cover did not disappear sufficiently from the icecaps to permit photography. Crystallographic and fabric studies were begun on the ice cores collected in 1965 from the borehole on the Meighen Icecap.

Logistic support was provided for glaciological studies by McGill University on Axel Heiberg Island and by the Arctic Institute of North America on Devon Island.

Gravity

The regional gravity survey was continued to cover the continental shelf and continental slope offshore from Prince Patrick Island, part of the inshore region of Lincoln Sea and of northern Robeson Channel between Ellesmere Island and Greenland, and over north-western Baffin Island and Bylot Island.

Heat Flow

Measurements of the flow of geothermal heat from the ocean floor were continued in the region of the continental shelf off Prince Patrick Island and in Crozier Channel.

Hydrographic Survey

The bathymetric survey of the continental shelf and slope, and of the straits and sounds between the western Queen Elizabeth Islands, was continued, with through-the-ice sounding on a grid spacing of 7 to 10 kilometres over about 35,000 square kilometres of the Arctic Ocean offshore from Prince Patrick Island. Decca Lambda position control was used. This work will be for publication on a scale of 1:500,000. A beginning was made on the standard hydrographic survey of Robeson Channel and Lincoln Sea, for publication on a scale of 1:50,000; but unexpected difficulties in position control were encountered, and only reconnaissance sounding was accomplished.

Periglacial Studies

A detailed study was completed of the periglacial features of the Arctic coastal plain and adjacent parts of Prince Patrick Island. Pingo-like forms, sand dunes, raised and dissected deltas, and scraps were investigated as to their structure, mineral and textural composition, and method of formation. This work was carried out by a geomorphologist from the University of Liege under a grant from the Canada Council.

Radio Wave Propagation Studies

The unexpected difficulty encountered in attempting to use Decca Hi-Fix position control for the hydrographic surveys in Lincoln Sea and Robeson Channel was determined to be caused by irregularities in the propagation of radio waves over thick rough

sea ice. This difficulty had not been encountered, to a degree sufficient to interfere with the survey, in the interior of the Archipelago where the sea ice is somewhat less thick. A series of experiments was carried out, with the assistance of a party from the Defence Research Telecommunications Establishment, to determine the radio transmission properties over the Lincoln Sea and Robeson Channel ice at different frequencies and throughout the year with changing ice conditions. The results showed significant effects of sea ice on radio transmission, which will have important and in some cases inhibiting consequences on electronic survey and navigation systems.

Rocket Sounding Programme

Certain field support was provided in connection with a rocket launch site constructed on one of the Queen Elizabeth Islands as part of the space sounding programme of the National Research Council.

Sea Ice Studies

Systematic patrols were made of all major waters of the Queen Elizabeth Islands and of the adjacent Arctic Ocean and Parry Channel, throughout the season of significant sea ice activity. Information was collected on the nature, break-up, amount, distribution, dispersal, and formation of the sea ice and of certain tabular icebergs or "ice islands". It has proved possible to follow the movement of the same ice throughout the season and from year to year. The continuation of these surveys for a number of years is beginning to show the range of variations and apparently significant consistencies in sea ice nature and movement from year to year. Information is collected relating the behaviour of the ice to meteorological and oceanographic factors; this, it is hoped, will lead to a better understanding of the causes and controls of sea ice development and movement and thus, in turn, to better forecasts of ice conditions.

Preliminary studies were carried out of the distribution of thickness, level of saturation, the height of the surface above "sea level" of an unbroken and enclosed body of sea ice, as typified by the bay ice of Mould Bay; and of the changes that occur with advancing summer and

melting. The relation between these parameters was found to be complex; neither the water surface nor the ice surface follow an obvious control. It will require careful, sophisticated measurements to provide further information on the little-understood relationship between the ice cover and the water supporting it.

Sub-ice Acoustics

Logistic support and field facilities were provided for a programme of investigation of the characteristics of the transmission of sound under unbroken pack ice over deep water, offshore from Prince Patrick Island.

Topographic and Geodetic Surveys

Location surveys were completed for the establishment of the Decca Lambda survey and navigation chain to cover M'Clure Strait. Surveys were run to provide additional ground control for aerial photography, and to record current glacier movement, in the icecap area of Melville Island. Glaciological surveys were carried out on the Meighen Icecap. The precise survey of a geodetic network between Ellesmere Island and northwestern Greenland was continued.

Plans for 1967

Field work will be continued in all of the major activities of 1966. Most of the work will be a direct extension of that of 1966, and in the same or a contiguous area. In addition, a long-range seismic refraction traverse is planned, to be run northwest from Prince Patrick Island across the continental shelf and continental slope to the abyssal plain of the so-called Canada Basin. Gravity, heat flow, and hydrographic data will be obtained along the route of the traverse. Other long-range gravity traverses may be attempted over the ocean if conditions are favourable.

Minor investigations outside the direct responsibilities of the Department of Energy, Mines and Resources, and co-operative work with other groups engaged in scientific studies in the area, will be undertaken or supported as circumstances warrant.

The field work is expected to engage a total of about 90 men, including personnel under contract and crews of supporting aircraft. Aerial transport in the field, including that under Project contract management

but assigned to work carried out by or directed by other agencies of the Department of Energy, Mines and Resources, will be provided by two Bell 204B helicopters, one Bell 47G4 helicopter, two Sikorsky S-55 helicopters, three deHavilland DHC-3 Otters, one Douglas DC-3, and one Beechcraft D18S aircraft, with larger freighter aircraft as required. Ground transport includes six tracked and wheel vehicles and about 12 motor toboggans and small amphibious vehicles. The central base camps will be at Mould Bay and Alert; and additional established or semi-permanent facilities will be operated at Resolute, Meighen Island, Brock Island, Melville Island, and the seaward coast of Prince Patrick Island. At the end of the 1967 field season it is planned to move the Decca Lambda survey and navigation system to give coverage of M'Clure Strait and the ocean to the west.

SURVEYS AND MAPPING BRANCH

Responsibilities: To carry out all geodetic, topographic, and legal surveys, and to produce topographical maps and aeronautical charts required for administration, development, and defence purposes.

Long-term Plans

Geodetic Control

To extend horizontal and vertical control as developments warrant and facilities permit, and to obtain data from astronomic observations for investigations of the size and shape of the earth. In the Robeson Channel area a long term investigation will be conducted to determine if there is relative crustal movement between Greenland and Ellesmere Island.

Mapping

To complete topographical coverage at 1:250,000 by 1967; to provide 1:50,000 and, if necessary, larger scale mapping of major routes of travel and other areas of economic importance or development; to revise air chart bases as better information becomes available.

Aeronautical Charting

To revise the portrayal of aids to air navigation on aeronautical charts and pilots handbooks and other air information publications, and to produce new aeronautical charts as required.

Legal Surveys

To manage and execute surveys made to enable land or resource transactions involved in the administration and development of public or other lands.

Review of 1966 Operations

Geodetic Control

The triangulation arc which reached the 60th parallel from the north in 1965 was extended west along the 60th parallel to the vicinity of the

Manitoba - Saskatchewan boundary. Most of the work lies in Manitoba, but two first-order stations and one precise astronomic station were established in the Northwest Territories, and ties were made to two Topographical Survey stations north of the boundary and to four Northwest Territories - Manitoba boundary monuments. A precise level line was established along the highway south from Yellowknife, connecting to the geodetic network at Enterprise. A small party installed the monuments at the twelve station sites of the "crustal movement" network which will connect Ellesmere Island to Greenland across Robeson Channel; six stations sites are in the Northwest Territories and six in Greenland; the Polar Continental Shelf Project provided support for this operation. A staff engineer, loaned to the Geographical Branch, established a control survey at the south end of the Barnes Icecap on Baffin Island. The work of the Joint Canadian - United States Satellite Triangulation Project was continued until the end of May; however the observing parties at the two stations in the Northwest Territories, Cambridge Bay and Frobisher Bay, were evacuated on March 3 and April 24 respectively; two staff members assisted in the work at Frobisher Bay.

Topographical Mapping

Field work:

- (a) Control was established for mapping 44 sheets at the 1/50,000 scale in south-western Yukon.
- (b) Radio aids to navigation at Watson Lake, Laberge, Mayo, Burwash and Snag were positioned for the Department of Transport.
- (c) Assistance was given to the Polar Continental Shelf Project on Banks, Melville, Meighen, and Ellesmere Islands.

Map Compilation:

- (a) Twenty-three sheets in the Arctic Islands and four sheets covering islands in Hudson Bay and Hudson Strait were completed for publication at the 1/250,000 scale.
- (b) Forty sheets were completed for publications at the 1/50,000 scale: seventeen at the Baffinland iron prospect, eight at Taltson Lake, eight on the Mackenzie River, and seven around Mayo.

- (c) The second sheet covering Whitehorse, Y.T. at the 1/25,000 scale was completed.
- (d) Special plots were made of areas of interest at Fort Resolution, Fort Simpson, Tuktoyaktuk, Whitehorse-Skagway, Fort McPherson, Coral Harbour, Eskimo Point, Lake Harbour, Cape Dorset, Devon Island, and Frobisher Bay. Preparation was done for special plots to be completed by contract for Cambridge Bay, Perry Island, Wrigley, Hay River, Murphy, Clyde River, Padloping Island, Tuktoyaktuk, and Igloodik.
- (e) An uncontrolled mosaic was made of Steele Glacier in the St. Elias Mtn. Range.

Aeronautical Charting

Aeronautical information was revised for existing aeronautical charts and publications as required for civil and military use.

Topographical information was revised on four 1:500,000 charts and two 1:1,000,000 charts.

Legal Surveys

Yukon Territory - A Special Survey was carried out near Dawson City involving the re-establishment of the boundaries of the Klondike Government Concession originally surveyed in 1898 on Hunker Creek. Work was commenced on a monumented co-ordinate control survey network for the purpose of correlating mineral claims and future surveys in the same general area. A 29-lot subdivision was laid out at Rock Creek, which is also in the Dawson City area. Ten miscellaneous parcels were surveyed, the majority of these along the Whitehorse - Mayo Road, and a half-mile of the Tagish road was resurveyed. Contracts were let for a number of projects to be completed by a surveyor in private practice. These included surveys of 5 public camp grounds, 2 landing strips, a subdivision at Destruction Bay, and a mineral claim control survey in the Van Gorda Creek area where a very large number of claims have been staked in recent years.

Northwest Territories - parcel surveys were made at the following locations: Heart Lake (2), Enterprise (5), Hay River (8), Fort Smith (4). Subdivision surveys were made at Prelude Lake (43 lots), Wrigley (123 lots), Inuvik (153

lots), Hall Beach (50 lots), Igloolik (104 lots), Broughton Island (82 lots). Surveys to provide control on vertical air photographs (photo-control surveys) to enable the correlation of property boundaries with topographical and cultural detail on plans for use in future development were made at Wrigley, Colville Lake, Hay River, Niko Island, Clyde River, Igloolik, and Padloping. These surveys were made by parties under the supervision of two Dominion Land Surveyors from the Legal Surveys and Aeronautical Charts Division. In addition, surveyors in private practice carried out subdivision surveys at Spence Bay (71 lots), Gjoa Haven (93 lots) and Cambridge Bay (115 lots), as well as photo control surveys at Perry Island and Cambridge Bay.

Plans for 1967

Geodetic Control

The triangulation arc along the 60th parallel will be extended west to connect with existing surveys near Selwyn Lake. Some of the stations in this arc will be in the Northwest Territories, and several ties will be made to Northwest Territories - Saskatchewan boundary monuments. Several tellurometer baselines will be measured in the existing triangulation arc between Selwyn Lake and the Thelon River. The "crustal movement" network across Robeson Channel will be observed; the Polar Continental Shelf Project will provide support. Gasoline and petroleum products will be shipped to Wager Bay and Repulse Bay for use in 1968. A line of precise levels will be established along the new highway from Enterprise to Pine Point and Fort Smith, connecting to existing levels at Hay Camp, Alberta. An engineer will be assigned to conduct surveys on the Barnes Icecap on Baffin Island.

Topographical Mapping

Field Work:

Control surveys are proposed for mapping several islands in Hudson Bay at the 1/250,000 scale and for mapping around the airport at Yellowknife at the 1/25,000 scale. Assistance will be given to other organizations in surveys among the Arctic Islands. Some agency will establish control for detailed mapping of the Steele Glacier.

Map Compilation:

Four sheets of Hudson Bay Islands remain to be compiled in 1967 at the 1/250,000 scale. About ninety sheets at the 1/50,000 scale are scheduled

for compilation on Baffin Island, Nonacho Lake, Mackenzie River, Whitehorse, and Mayo. Special large-scale plots will be made as required and material for ten northern sites will be prepared for compilation by contract. Photo-grammetric plots illustrating Steele Glacier prior to its abnormal flow and at two periods during its activity will be prepared for field use in 1967 and to assist a centennial climbing project in an adjoining area.

Aeronautical Charts

Aeronautical information in existing aeronautical charts and publications will be revised as required. Topographical information will be revised as new large-scale mapping becomes available.

Legal Surveys

Yukon Territory - official requests for surveys in the Territories have not yet been received. However, from preliminary information it appears that there will again be a need for a number of surveys for the purpose of sale or reservation of lands relating to public camp grounds, subdivisions, air strips, fire lookout sites, etc.

Northwest Territories - surveys of a number of settlement subdivisions will probably be required in the Eastern Arctic, Arctic Islands, and the Mackenzie District. There will probably be requests for surveys of miscellaneous lots for various purposes in the Mackenzie District as well and it is expected that a co-ordinate control survey will be carried out covering the town of Yellowknife.

DEPARTMENT OF EXTERNAL AFFAIRS

DEPARTMENT OF EXTERNAL AFFAIRS

Responsibilities: The Department of External Affairs is concerned with any activities in the north conducted on behalf of or in co-operation with foreign governments or their agencies, in particular scientific or other projects in both the civil and military spheres. The Department is also concerned with co-ordinating, by means of an interdepartmental committee, all forms of transportation in the Pacific Northwest (in particular, road, rail and marine transport) to the extent that these involve relations with Alaska and the U.S. federal authorities and, to this end, is concerned with the general transportation problems of that part of the north adjacent to Alaska. The Department is similarly, though less actively, concerned with boundary waters in this area. The Department is also responsible for co-ordinating with the appropriate Departments the granting of permission for foreign scientists and explorers wishing to work in the north.

Review of 1966 Operations

Winter Maintenances of the Haines Road

The Canadian Government hopes to be in a position very soon to announce proposals concerning future arrangements for winter maintenance of the Road. In the meantime appropriate arrangements covering the central portion of the Road between Mile Post 48 and Mile Post 94, which have been in effect for the past three years, were renewed on the same experimental basis for the 1966-67 winter season by an exchange of Notes between the Government of Canada and the United States Embassy in Ottawa, dated September 28, and October 14, respectively. The Department of Public Works was again granted authority to negotiate directly with the State of Alaska for the rental of road maintenance equipment on the same basis as for the previous three winter seasons. As in the past clearance of the southern portion which lies mostly in the Alaska Panhandle is being carried out by the United States Army; the northern portion is again being kept open by the Department of Public Works on the basis of reimbursement by the United States Army.

DEPARTMENT OF FISHERIES

DEPARTMENT OF FISHERIES

INSPECTION SERVICE

Responsibilities: Inspection of fish and fishery products and fish processing establishments to ensure compliance with the Fish Inspection Act, the Meat and Canned Foods Act, and the regulations made thereunder.

Long-term Plans

To promote greater utilization of fishery products by ensuring that products reaching the consumer are of good quality and have been produced under sanitary conditions, and by providing technical assistance to the industry in the development of improved handling and processing methods and new products.

Review of 1966 Operations

Inspection Service operations were centred at Hay River, but every effort was made to provide service as close to the production source as possible, and, during the past year, fish products were inspected at Inuvik, Yellowknife, and Nueltin Lake, as well as at Hay River.

The quality problem on Great Slave Lake, which required special attention in 1965, has been overcome but a further problem arose in 1966 associated with the sanitary condition of processing establishments. As a result, interim sanitary requirements were imposed on establishments processing fish for export, pending implementation of revised inspection regulations on April 1st, 1967. These regulations will provide detailed standards for construction, equipment, and operating methods which must be met by processing establishments.

CONSERVATION AND PROTECTION SERVICE

Responsibilities: Conservation, protection, and wise utilization of the fisheries by appreciation of proper management techniques

and practices, and by enforcement of the Fisheries Act and regulations made thereunder.

Long-term Plan

To conserve and protect the desirable fish and marine mammal populations by application of modern conservation measures wherever necessary. To encourage the development of the fishing industry in the territorial economy. To encourage the optimum use aspects of the three types of fishing; i.e., commercial, sports, and domestic, dependent upon circumstances of markets, transportation access, and other factors.

Review of 1966 Operations

The fisheries of the Northwest Territories continue to be controlled from the Department's base at Hay River although co-ordinated activities may originate for Keewatin District from the Department's base at Lynn Lake, Manitoba. Yukon headquarters are at Whitehorse.

Enforcement work in the Northwest Territories was carried out by aircraft, patrol vessel and craft, snowmobile, and motor vehicle. In the Yukon Territory, aircraft, patrol craft, and motor vehicles were used.

Officers from Hay River travelled widely in the performance of their duties. In addition to work on Great Slave Lake, Great Bear Lake, and a multitude of other smaller lakes, they journeyed to the Arctic coast and islands, remaining for periods as necessary for conservation of fish and sea mammals. Officers from the Lynn Lake base worked throughout Keewatin District including surveys of Chantrey Inlet and adjacent waters in anticipation of increased sports fishing and lodge activities. These officers are also involved in the fisheries of Hudson Bay, including the beluga commercial and sport operation out of Churchill.

In all activities there was close liaison and collaboration with Indian Affairs and Northern Development officials, as well as Fisheries Research Board field staff.

There was a major adjustment in the Control Area System which had been originated in 1961 for orderly commercial fishing activities in lakes other

than Great Slave, and those protected for domestic or angling purposes. The 8-area method ceased, and the entire Control Area is regulated as one with lakes being fished on a quota basis for two years followed by a four-year closure for recovery. As experience was gained by industry, economic advantages, compatible with conservation measures, emerged and the modified system was developed accordingly.

RESOURCE DEVELOPMENT SERVICE

Responsibilities: The maintenance and development of economically important stocks of fish and shellfish in a number of coastal and inland areas; the design and execution of management and development programs aimed at enhancing sport and commercial fish populations.

Long-term Plans

To develop the existing sport fish program in the Yukon Territory. Observations and studies of possible pollution and other problems associated with fisheries will be dealt with as required.

Although no decision on the question has been reached, there appears to be a need for assignment of staff to deal with the applied fisheries aspects of Northwest Territories problems.

Review of 1966 Operations

The Yukon Territory sport fish development program was continued by Resource Development Branch staff from the Pacific Region. For the second consecutive year Rainbow Trout eggs were supplied to Hanson Lake near Elsa; assessment studies of earlier stocking programs were conducted at Ruth Lake near Whitehorse and Long Lake. Pre-stocking surveys were completed at Watson Y Lake in preparation for a poisoning and trout stocking program.

Observations were conducted at two mine operations to determine if pollution to fish bearing waters would result from the release of mine waste material. The Cantung and New Imperial Mine properties were examined.

Plans for 1967

Continuation of existing programs as outlined above.

FISHERIES RESEARCH BOARD OF CANADA

Arctic Biological Station

Responsibilities: Biological investigations of marine, freshwater, and anadromous fish in the Canadian arctic and subarctic, and marine mammal research in both arctic and northwest Atlantic waters; including oceanographic and limnological studies.

Long-term Plans

To develop a biological basis for maximum sustainable use of available resources by the native population and by others interested in commercial and sport fisheries. The fisheries investigations are now passing from the exploratory phase into basic productivity studies, including year-round observations of the arctic aquatic environment. Plans include expanded marine mammal investigations, in line with an increasing interest in exploitation of various kinds of whales and seals.

Review of 1966 Operations

Biological Oceanography

Zooplankton: Work on the life histories of the copepods *Calanus* and *Pseudocalanus* is being carried out in association with staff of the Greenland Fisheries Laboratory at Charlottenlund.

Phytoplankton: Progress continued on preparation of manuscripts on several topics including a comprehensive study of starch in the oceans.

Fisheries Investigations

Great Bear Lake: Staff continued the analysis and publication of data obtained in a 3-year limnological and fisheries survey of Great Bear Lake that ended in 1965. The phytoplankton collections gave 250 species but all were scarce, as expected from the extremely low level of nitrates, phosphates, and other nutrients shown by water analyses. While freshwater algae predominated, some marine diatoms and silicoflagellates suggest an earlier occurrence of saline pro-glacial waters. Production of all fish species is low. Only lake trout has widespread distribution, but it grows slowly and does not reach sexual maturity until 14 years old, when it weights about 5 pounds. Other fish species including whitefish

lake herring, grayling, and yellow pickerel have restricted distribution and low productive capacity.

Cambridge Bay: A tagging and recovery program with Greenland cod gave a population estimate of 12,000 fish within the harbour. So far this species has never been reported in offshore arctic waters and there is no evidence of migrations or exchange with other coastal bays. Year-class survival has been found limited to a 5- to 7 -year average and it is therefore unlikely that stocks could withstand extensive fishing.

In marine waters offshore from Cambridge Bay fish populations consisted mainly of small forms, predominantly arctic cod; total fish biomass was estimated at 3 pounds per acre, and invertebrate biomass at 4 pounds per acre.

A new long-term investigation of marine productivity was started in Starvation Cove 40 miles west of Cambridge Bay, using the M.V. "Salvelinus". Plankton, benthos, and fish are being collected systematically at intervals on a 10-square-mile area. The program includes year-round observations. Facilities include a semi-permanent laboratory erected in 1966 on the shore of the cove.

Tree River: Extensive sport fishing for arctic char in the Tree River from 1964 to 1966 gave a total 3-year catch of 150,000 pounds, or approximately 21,000 fish at an average weight of 7 pounds. The catch per unit of effort fell from 0.40 fish per rod hour in 1964 to 0.16 fish per rod hour in 1965 but controlled fishing intensity since 1964 has now resulted in a 3-fold increase over the 1964 level.

Keyhole Lake: The standing crop of landlocked arctic char in 120-acre Keyhole Lake, Victoria Island (a typical small arctic lake) was estimated to be 50 pounds per acre from a tag and recovery program started in 1963 and concluded in 1965.

Effects of DM & TS Seismic Explosions: In August a series of 16 one- and two-ton seismic explosions in lakes of the Northwest Territories was observed to assess the effects on fish. In some cases many lake herring and whitefish as well as some lake trout were killed within a radius of about 300 yards. The project provided an opportunity to obtain fish samples for data on length, weight, sex, parasites, etc., from several lakes not previously examined.

Marine Mammal Investigations

Harp Seal: Investigations for 15 years on Canadian harp seals to provide a sound basis for managing the fishery have included (1) aerial surveys to give the number of whelping adults and their young, (2) tagging newborn seals and analyzing recaptures made during the ensuing brief fishery, (3) following in different areas the range of ages of females at which sexual maturity is reached to indicate separateness of stocks, since a heavily-exploited stock reproduces at a higher rate than a lightly-exploited stock.

Harp seals are divided into two stocks or herds, one whelping and moulting in the Gulf of St. Lawrence, the other east of Newfoundland and Labrador. These herds mix in summer in arctic waters. The Gulf herd produces about 350,000 pups per year and the total population before pupping is about $1\frac{1}{2}$ million. It has never been overfished and the original population probably never exceeded 2 million. Now 85,000 young and 15,000 older animals are taken annually by Canadian ships, aircraft and landsmen. The Department of Fisheries imposed a quota of 50,000 young seals for ships and aircraft in the southern Gulf in 1965. The maximum sustainable yield is about 95,000 young and 18,000 older animals per year.

The east coast of Labrador or "Front" herd once numbered about 2 million animals and produced about 430,000 pups per year. In recent years production of pups has been reduced to about 200,000 annually. Apparently some animals enter it from the Gulf herd. Recent annual "Front" catches of 180,000 young and 30,000 older animals are considered to be excessive.

Grey Seal: Population and behaviour studies of grey seals have been carried on for several years in the Gulf of St. Lawrence and off eastern Nova Scotia to assist management authorities reach a decision on the need for and method of stock reduction. The species is an important vector of parasitic nematodes in codfish and damages salmon nets. Observations in 1965-66 indicated that controlled killing of several hundred animals would be desirable and feasible during the breeding season in January. This information was used by the Department of Fisheries in allowing a limited kill on the Basque Islands, N.S. in January 1967, after such action had been requested by local salmon fishermen.

Ringed Seal: Previous intensive research of the ringed seal off Baffin Island ended in 1958 and there is now a need for new biological studies over a wide area of the arctic. In 1966 ringed seals came under intensive

population study in Cumberland Sound where there is relatively heavy exploitation. Later the work will extend northward to Home Bay where the species appears to be under-utilized, to assess the significance of hunting pressure as a factor limiting stock size. Many birth lairs were found about 15 miles from nearest land, whereas earlier work indicated they were restricted to land-fast ice much closer to shore. Records of catch statistics and related information were improved by providing Eskimo hunters with illustrated booklets containing labels, maps, and containers for jaw samples which are used to age the seals. This produced 2000 jaws, which will give a distributional record of different age classes and their mortality rates.

White Whale: In August field staff collected valuable biological samples and data from 69 white whales taken in Cumberland Sound, 56 of them caught during a netting experiment conducted by the Department of Indian Affairs and Northern Development.

Large North Atlantic Whales: To provide information on which to manage an Atlantic coast fishery started in 1964 for large whales (mainly fin whales), an extensive survey and tagging program was initiated using a 165-foot chartered vessel. For a 3-month period starting July 17 the vessel operated first off Nova Scotia, Newfoundland, Labrador and west Greenland, then cruised southward to Venezuela, Puerto Rico and Bermuda. Tags were applied to 76 fin whales (of 283 sighted), 62 sperm whales, and 30 whales of seven other species. Fin whales were seen only within the continental shelf, from Cape Cod northward to 57°N on the Labrador coast. Two independent estimates of the stock size of fin whales were: (a) by tagging and recapture, based on 4 recoveries at Nova Scotia and Newfoundland whaling stations--6790; (b) by strip census, based on sightings adjusted for area carefully searched, visibility, etc.--6620. Assuming a 12% exploitation rate for sustained yield (as used in Antarctic fin whaling) the allowable annual catch from the above populations would be about 800. This first approximation to a quota will be used to control the 1967 fin whale fishery, when it is expected that four shore stations will operate in Newfoundland and Nova Scotia.

Plans for 1967

Continue to advise the Department of Fisheries on management of commercial and angling fisheries, mainly for arctic char and lake trout, in various waters of the Northwest Territories.

Start a new long-term year-round investigation of marine productivity and ecology on the east coast of Baffin Island, Frobisher Bay vicinity, using the M.V. "Calanus" and a semi-permanent shore-based laboratory.

Continue year-round marine productivity studies started in 1966 at Starvation Cove, Victoria Island, using M.V. "Salvelinus".

Start a comparative study of production in a series of four small Barren Ground lakes, to relate fish production to lake morphometry, limnology, and other factors as an aid to determining commercial catch quotas.

Study biology of white whale in Cumberland Sound, Baffin Island, and near Churchill. Tagging will be attempted in the hope of studying the interchange between herds.

In March 1967 study harp seal populations in the Gulf of St. Lawrence by an aerial photographic survey and by observing the time of whelping in relation to commercial sealing at the Magdalen Islands. A study of age composition, reproductive rate, and other aspects of life history of both Gulf and Labrador "Front" herds will be attempted from a chartered sealing ship in April-May. Also in March, young hood seals will be tagged around the Magdalen Islands using chartered helicopter.

Continue population studies of Baffin Island ringed seals in Cumberland Sound from Cape Dyer to Cape Henry Kater for comparative data from this under-exploited area.

Observe bowhead whales in vicinity of Point Hope, Alaska, and attempt to obtain comprehensive series of biological samples from them.

Continue from a chartered vessel the tagging program on North Atlantic whales to improve the 1966 population estimates, particularly for the fin whale. As opportunity arises obtain biological samples from North Atlantic dolphins.

DEPARTMENT OF FORESTRY
AND
RURAL DEVELOPMENT

DEPARTMENT OF FORESTRY AND RURAL DEVELOPMENT

Responsibilities: To prepare forest inventories and forest management plans; to promote the adoption of improved methods of forest management and protection from fire best suited to the region; to conduct annual surveys and related research on forest insects and diseases; to provide advisory services to public and private forest management agencies on forest insect and disease control.

Long-term Plans

To determine the potentialities of the forest resources of the north, and to assist in the preparation of plans for their protection and utilization.

Review of 1966 Operations

Forest Management Research and Services Institute, Ottawa

In the Yukon, forest inventory data for the Upper Liard River were revised and tabular summaries of volumes by species are being completed. In addition, several minor jobs were undertaken at the request of the Northern Administration Branch and field officers of the Yukon Forest Service.

In the Northwest Territories, area summaries were completed for 28 Buffalo River series maps and 48 Wood Buffalo Park maps. Plots were grouped and reclassified and the preparation of timber estimates for the seventy-six maps, at a scale of one mile to the inch, is under way. Photo maps were made of areas along the Arctic Red River and in other localities; volume estimates for these areas are being prepared.

In the Mackenzie River Delta, a test of a new forest inventory technique was undertaken using double sampling by large-scale air photography at a scale of 1:2000 and medium-scale air photography at about 1:16,000. The test area consisted of about 1000 square miles of the southern portion of the Delta and the lower reaches of the Peel River. The sampling consisted of about 250 line miles of large-scale air photography from which random

photographs were chosen for tree and plot measurement. Two men spent about six weeks measuring randomly selected plots chosen from the aerial sample plots. The compilation is in progress; the final report will consist of forest typed aerial mosaics at a scale of 1:50,000, tables showing volumes and a description of the procedures.

Alberta - Northwest Territories & Yukon Region, Calgary, Alta.

Insect and disease surveys in the Yukon were undertaken for the first time by Calgary based staff, and a summer headquarters was established at Whitehorse. In addition to normal survey operations in the Northwest Territories, two field parties undertook a detailed study of damage and growth losses in areas along the Slave River infested with the spruce budworm.

Two areas, one near Whitehorse and the other on the shore of Watson Lake, reserved for use as forest experimental areas, were examined with a view to developing operational plans.

Plans for 1967

The Forest Management Research and Services Institute has no planned field work but will concentrate upon completing reports on previous surveys.

The Alberta-Territories Region will continue surveys of forest insects and disease with staff based seasonally at Whitehorse and Fort Smith. Other research programs will gradually be extended into the Territories as staff increments permit.

**DEPARTMENT OF INDIAN AFFAIRS
AND
NORTHERN DEVELOPMENT**

INDIAN AFFAIRS BRANCH

Responsibilities: The administration of the Indian Act, as amended.

The fundamental responsibility of the Indian Affairs Branch is to assist Indians to participate fully in the social and economic life of Canada. These responsibilities are met by specific programs in the fields of education, economic development, social welfare and community development. All of these programs foresee the Indian people sharing the rights and responsibilities of citizenship and participating on the basis of equality of opportunity through the full spectrum of Canadian life.

Long-term Plans

The continued development of the natural resources of fur, fish, and game is essential for Indians of the north who depend on these resources for a livelihood. The Indian Affairs Branch, in co-operation with other agencies, will continue to foster the development of sound trapping and commercial fishing programs, domestic fishing, and hunting projects, and encourage Indians to participate in all aspects of tourism related to sports hunting and fishing. In addition, the Branch will continue to encourage and assist in the establishment of marketing co-operatives and the promotion of handicraft production and sales.

In the field of education, the Indian Affairs Branch will continue to arrange for the enrolment of Indian children in the Yukon Territory in schools operated under the Yukon Territorial Government and explore means of having Territorial education services extended further to Indians resident in the Yukon.

With regard to welfare services the long-term objective is the total extension of such services to Indians administered by the Territorial welfare agencies.

Review of 1966 Operations

According to the Registered Indian Record, there were 2,292 Indians in the Yukon as of December 31, 1965.

The Indian Affairs Branch continued a buying and selling service in handicrafts. In addition, information was compiled during the year to assist in the formulation of plans for a major co-operative to be located in Whitehorse to serve the entire Territory.

Financial assistance was provided for a first-time conference attended by representatives of all Indian groups in the Yukon Territory. The Indian people at this conference founded the Klondike Indian Association which is the first attempt for an association of this kind in the Yukon.

Closer co-ordination with the Territorial Administration was realized in the area of community planning, particularly in respect to Indian settlements adjacent to non-Indian Territorial communities. The importance of participation in the early stages of physical development in their communities was made apparent to the Indian people. New small sub-divisions were laid out at Burwash Landing and Ross River. A preliminary ground plan was started at Upper Liard.

Twenty-five houses were built in the Yukon, all based on log construction and offering a maximum of participation by local Indian labourers. A log cutting program at Marshall Creek on the Alaska Highway provided a stockpile of 3,000 logs at Whitehorse for future use. A Community Hall was constructed at Upper Liard as a physical base for social and educational development.

The Branch assisted in the wiring of homes in several villages in the Yukon. Electricity was provided in Indian homes at Upper Liard, Burwash, Haines Junction, Ross River, Teslin, and Pelly.

In education, the total Yukon enrolment is 654 pupils. Of these 72 attend Carcross Indian Residential School and the remaining 582 are in territorial schools. Out of 181 in grades 7-12, 137 attend the Whitehorse Public Schools whilst residing in the Yukon and Whitehorse Hostels. Fifty-two pupils are enrolled in the Whitehorse Vocational School, thirty-one in vocational courses and twenty-one in upgrading programs. Ten students from the Yukon are enrolled in vocational and upgrading courses in British Columbia. During the year the Branch agreed to make contributions of \$111,049 towards the expansion of school facilities at Ross River, Pelly River, and Watson Lake.

The program covering all phases of resource utilization continued Commercial fishing expanded at Dawson, Teslin, and Frances Lake where assistance in marketing and securing better equipment generated increased interest. Grub staking, equipment assistance on a repayable basis, instruction in improved techniques, transportation, and marketing help resulted in a marked rise in trapping results.

Plans for 1967

Community planning will receive further attention in collaboration with band councils and the Territorial Administration.

Twenty-five houses will be constructed and some new road work will be done. New wells with protective well head houses will be built in six locations. Feasibility of extending the City of Whitehorse water system to serve the Indian Village and adjacent non-Indian households will be considered.

The handicraft service will be maintained and a start may be made on a proposed major co-operative operation to cover all aspects of the handicraft industry.

NATIONAL PARKS BRANCH

Responsibilities: The administration of the National Parks Act and regulations in order that national park areas in northern Canada are maintained and made use of for the benefit, education, and enjoyment of the Canadian people.

Long-term Plans

To select and administer areas which contain representative features worthy of preservation as part of the National Parks System.

Review of 1966 Operations

Wood Buffalo Park

The anthrax control program was continued. There have been no known anthrax deaths of bison since 1964. The road between Fort Smith and Pine Point was completed in the fall of 1965. Nothing further was done regarding boundary adjustments.

Plans for 1967

Study of park potential if specific requests made. Continuation of anthrax control measures. The possibility of boundary adjustment is still an open question. Patrol of the Fort Smith - Pine Point road, particularly in view of nearby whooping crane nesting grounds.

CANADIAN HISTORIC SITES DIVISION

Responsibilities: At the present time this Division's responsibilities in the North are fairly limited. Most of the present suggestions for commemoration of historically important persons, places, or events are of a territorial, as opposed to national, nature only. This work will be handled by the territorial governments with advice where necessary being supplied by the federal government.

In particular, the Division is responsible for the maintenance of the Palace Grand Theatre and the S.S. Keno, a sternwheeler, at Dawson in the Yukon, and for the restoration of the S.S. Klondike, another sternwheeler, in Whitehorse.

Long-term Plans

Assistance to the territorial governments in their historic site marking program.

Restoration of the S.S. Klondike over a five-year period at an estimated cost of approximately \$238,000. This plan includes movement of the vessel to a new site, restoration and refurbishing of the vessel, and the establishment of a museum on board.

Review of 1966 Operations

Maintenance of the Palace Grand Theatre and the S.S. Keno was continued.

The S.S. Klondike was moved to what will be its permanent site at South Whiskey Flats and was boarded up to prevent vandalism. It was also decided to protect the two remaining sternwheelers, the S.S. Casca and the S.S. Whitehorse, and these were also boarded up.

Plans for 1967

Maintenance will be continued on the Palace Grand Theatre and the S.S. Keno.

The work of restoration and refurnishing the S.S. Klondike will be started. Fencing will be placed around the S.S. Casca and the S.S. Whitehorse to protect them.

CANADIAN WILDLIFE SERVICE

Responsibilities: Surveys and inventories of wildlife resources; conducting research on wildlife species in relation to their habitat; collection and analysis of animal population and utilization data; recommending management procedures for particular species of economic importance; research, management, and administration of migratory birds under the Migratory Birds Convention Act; co-ordination of federal, provincial, and territorial action on common wildlife problems, including caribou research and management, and wildlife disease studies.

Long-term Plans

To continue studies of major wildlife resources: to extend research to less-known species; to establish more adequate research facilities in the field; to assess the success achieved in management of wildlife resources to date, and the potential success in this endeavour for the future.

Review of the 1966 Operations

Mammal Projects

Preliminary studies of the range in the Reindeer Preserve were undertaken by a range ecologist as the initial phase of an intensive study to determine the value of the range to reindeer and the numbers of those animals that can be supported efficiently.

The study of the basic nutritional requirements of barren-ground caribou and other physiological characteristics was continued in co-operation with the University of British Columbia.

Studies of barren-ground caribou distribution and utilization were continued. A group of five biologists are now studying the Manitoba-Keewatin herds intensively. Their studies are concerned with population dynamics, range-carrying capacity, development and perfection of aerial survey techniques, movements, and all other parameters necessary to develop a sound management program for the utilization of the caribou.

The study of the ecology of wolves on barren-ground caribou range was terminated after the field season, and complete report of the entire study is being prepared.

A preliminary assessment of the feasibility of conducting a study of Baffin Island wolf ecology was undertaken northeast of Wordie Bay in 1965 and a more intensive study began in 1966 under contract with the University of Toronto.

Polar bear research was continued and trapping and marking techniques were successfully applied. Some progress was made in co-ordinating this study with those being carried out by Ontario, Manitoba, and Quebec.

A study of the ecology of grizzly bears in the Yukon Territory was continued in the Kluane Game Sanctuary and additional biological data were obtained from bears killed by sportsmen elsewhere in the Yukon.

Studies of muskrat, beaver and mink ecology were continued on the experimental trapping area in the Mackenzie Delta. Carcasses from marten trapped in the Anderson River country were collected for reproductive and other biological information. A study on the food and energy relationships in beaver in the area is nearing completion.

Factors affecting the distribution and numbers of red squirrels were studied in the Fort Smith area. This project has been terminated with the final report due in April 1967.

Studies on the population status and habitat of wood bison were conducted in the Fort Providence area and a small group of wood bison was isolated into corrals near Fort Smith for further studies. Anthrax control in the bison continued in Wood Buffalo National Park and in areas north of the Park and no deaths that could be positively attributed to anthrax were recorded.

Preliminary studies were begun on a game survey in Game Management Zone 12 in the Mackenzie Mountains. A research program on the life history of Dall sheep in the area was also begun.

Ornithology Projects

A study of the breeding biology and distribution of Ross's geese was continued in the Queen Maud Gulf area.

Periodic aerial surveys of whooping crane breeding areas in Wood Buffalo National Park were continued.

Aerial reconnaissance of goose habitat on Baffin Island, Southampton Island, and Melville Peninsula was carried out.

Banding of geese was carried out at two colonies on Southampton Island.

Under three contracts with the University of Western Ontario; work continued near Eskimo Point on the life history on population dynamics of small races of Canada geese which breed there, on the feeding habits and nutritional requirements of snowgeese at McConnell River, and on the family group structure of these geese. The factors influencing predation on goose colonies by parasitic jaegers was also being studied there.

Banding of whistling swans in the Mackenzie Delta was started.

Investigations on the life history of ravens in the Inuvik area were begun.

Banding of moulting Canada geese continued in the Thelon River area.

Under contracts with the University of Saskatchewan, comparative studies of knot and turnstone breeding biology and behaviour, and of pomarine and parasitic jaegers were completed in the Hazen Lake area.

An investigation of waterfowl breeding in the Old Crow Flats area was started.

Banding of Canada geese at Soper River, Baffin Island, was carried out.

A survey of eiders nesting in the Frobisher Bay area was carried out.

Plans for 1967

Mammal Projects

The intensive study of the Manitoba-Keewatin caribou herds will be continued as a scientific team effort.

The research project on Dall sheep in the Mackenzie Mountains will continue with more intensive field studies on the biology of the sheep.

Work on bison in the Northwest Territories and in Wood Buffalo National Park will continue with more emphasis on putting management and disease control measures into effect.

Research will continue on the nutritional requirements and the physiological characteristics of barren-ground caribou.

In co-operation with the University of Toronto, a study of wolf ecology on Baffin Island will be continued.

Polar bear research will continue, with emphasis on tagging to obtain information on movements.

Grizzly bear research in the Yukon Territory will continue with increased emphasis on following movements of tagged animals.

Studies of population ecology of muskrats, beaver, and mink will be continued on the experimental trapping area in the Mackenzie Delta.

Ornithology Projects

All projects listed as having been carried out in 1966 will be continued, except for those listed as completed.

A biological assessment of geese breeding on the east coast of Foxe Basin will be started.

Ecology of ptarmigan in the Mackenzie Delta will be studied.

COUNCIL OF THE YUKON TERRITORY

Responsibilities: To exercise legislative powers comparable to those of a provincial legislature.

Long-term Plans

Enactment of legislation comparable to that of the Provinces and in keeping with changing conditions; gradual evolution toward responsible government and eventually provincial status.

Review of 1966 Operations

The Council was called for two Sessions. The first was from March 14th to May 12th, and the second from November 7th to December 2nd.

During the First Session 16 ordinances were passed, the most important of these being a new Ordinance Respecting the Immunity of Members of the Council of the Yukon Territory From Certain Civil Actions; an Ordinance Respecting Securities; and an Ordinance to Amend the Elections Ordinance.

The Second Session dealt with 18 ordinances, the most important of which was a new Workmen's Compensation Ordinance. This Ordinance is to come into effect on the first of April, 1967.

The Territorial Council visited Ottawa in January, 1967, to discuss the proposed Five Year Financial Agreement with the Federal Government and other matters of interest and importance to the Territory.

ADMINISTRATION OF THE YUKON TERRITORY

Responsibilities: To Administer the Ordinances of the Yukon and carry out the responsibilities of the Department of Indian Affairs and Northern Development, Northern Administration Branch, in the Territory.

Long-term Plans

Economic and Political Development to the point where increased population and revenue resulting therefrom would warrant full responsible Government and eventual Provincial Status.

Review of 1966 Operations

Territorial Secretary

Under the Motor Vehicles Ordinance 18,712 Licenses, Certificates, Registrations, etc., were issued.

Under the Business License Ordinance 353 Business Licenses were issued.

Under the Vital Statistics Ordinance 371 Births, 85 Deaths, and 94 Marriages were recorded.

Under the Bills of Sale Ordinance, Conditional Sales Ordinance and Partnership Ordinance; 2,170 documents were registered.

The total real property assessment for the fiscal year 1965/66 was \$6,700,781 and the total tax levy was \$155,303.

All figures quoted, except for Births, Deaths, and Marriages, are an increase over the past year.

Senior Advisory Counsel

The Senior Advisory Counsel is a member of the Department of Justice seconded to the Yukon, and replaces the Legal Advisor formerly provided by the Department of Indian Affairs and Northern Development. The senior Advisory Counsel acts as Registrar of Land Titles, Registrar of Joint Stock Companies, Registrar of Corporate Securities, Registrar of Credit Unions, Registrar of Societies, and Registrar of Securities. He provides

legal advice to the Commissioner, Territorial Council, and the various Department Heads, and also acts as local agent for the Attorney General.

Companies registered totalled 160, against 50 the previous year. Revenue from Joint Stock Companies registrations was four times the 1965 figure.

Land Titles registration continued at its usual volume but there was an upturn in mortgage financing and on Crown leases and agreements for sale.

Territorial Department of Education

Enrolment in Territorial schools continued its upward trend. In September there were 3,335 pupils enrolled in 22 schools with a full-time teaching staff of 165. This compared with 3,178 pupils, 22 schools, and 149 full-time teachers in September, 1965.

At the end of June St. Mary's School in Dawson City and the Granville School, 50 miles out of Dawson City, were closed. Both of these were one-room schools. Two new schools were located at Pelly River and Ross River. Only one 1-room school is left in the Territory.

In addition to the 22 schools that are part of the Territorial system, the Department of Education also supervises instruction in the Carcross Indian Residential School and the Lower Post Indian Residential School. Between them, these two schools had 10 teachers and 221 pupils in September.

A major fire at the Whitehorse Elementary School on October 8 put the building out of operation until after the Christmas holidays. The 635 pupils of the school were placed on double-shift system with the classes of two other elementary schools. Only one school day was lost as a result of the fire.

A new experiment in Yukon education is being tried in the high school grades of the Dawson Elementary-Secondary and the F.H. Collins Secondary schools. Students in these schools are being taught on a semester system. It is too early yet to obtain valid evaluation of this method.

Vocational and Technical Training

The Whitehorse Vocational Training Centre continued with its expansion

program. The \$380,000 building extension was completed and brought into use, allowing for another 40 student places. The Commercial, Hairdressing, Drafting, and the Up-Grading courses were all enlarged giving the school 14 full time adult day courses.

A Night School extension program was initiated with fine results.

Upon completion of the building program, the school changed its name to "The Yukon Vocational and Technical Training Centre".

All students who graduated or completed their training were placed in the employment field.

Territorial Department of Public Works

All roads in the Territory, with the exception of the Alaska Highway and the Haines, Aishihik, Snag, and Cassiar Roads were maintained by Territorial Crews and equipment at a cost of \$1,486,700. The total mileage of roads maintained is 1503 which compares to 1,353 for the previous year.

The number of Territorial Buildings maintained during the year was 155 and buildings maintained for the Department of Indian Affairs and Northern Development, Northern Administration Branch, numbered 94. Total expenditures for building maintenance amounted to \$143,000. Campground maintenance, the maintenance of the SS Keno, and the Palace Grand Theatre amounted to \$39,000.

Building construction during the year amounted to \$513,000. Road and bridge construction amounted to \$561,000.

Forestry

Timber production declined although by the end of the year there were indications of increase. Total production was 3,624,707 board feet of lumber, 8403 cords of fuelwood, and 2,120,738 lineal feet of mine timbers and building logs.

The forest fire season was one of the worst on record with 193 fires burning an area of 393,000 acres. Firefighting costs were approximately \$600,000. with forest and land losses valued at \$281,000.

Forty-one campsites were operated by the Forest Service and major improvements were carried out in five sites. An estimated 106,000 tourists travelled the Alaska Highway during the season and it is estimated that 75% of these people used the campsite facilities.

Mining

The year registered a marked increase in activity for mining exploration. There were approximately 60 companies, 6 or more syndicates active, and approximately 15 prospectors receiving Prospectors Assistance. There were 6 independent prospectors and 15 employed prospectors active in the Yukon during the year.

Office of the Supervisor of Lands

There was little change in the volume of Land Applications and related activities although there were more enquiries about grazing land.

At the present time there is a shortage of housing in the Whitehorse Metropolitan Area and this should result in increased land sales in the Territorial Subdivisions in 1967.

Territorial Department of Travel and Publicity

A 32% increase in the number of tourists has continued the upward trend of this valuable industry. During the months of May to September inclusive over 106,000 persons visited the Territory. Tourist dollars during this period contributed approximately \$5,000,000 to the economy of the Territory. Enquiries processed during the year are expected to exceed 39,000 for a 10% increase over 1965.

Territorial Department of Housing and Area Development

This Department continued with the responsibility of providing municipal services in most communities other than Dawson City and Whitehorse and administered the Territorial Low Cost Housing Mortgage Program.

Water and sewer service was installed at Mayo and a sewer service was installed at Watson Lake.

The Territorial Second Mortgage program progressed with ten loans processed compared with one loan in 1965.

Territorial Department of Social Welfare

This Department is responsible for the provision of all Social Welfare Services to non-Indians in the Yukon and extends its Family and Child Welfare services to Indians by virtue of a special agreement with the Indian Affairs Branch of the Department of Indian Affairs and Northern Development. The Department is also responsible for the administration of a twelve-bed Nursing Home, two Senior Citizens Homes, two District Welfare Offices, and a branch office in Whitehorse which accommodates the Social Assistance Division and the Alcoholism Services Division.

Regional Library

The Regional Library Headquarters building was completed and occupied in January, and provides for the Regional Headquarters and the Whitehorse Branch Library as well as a small Art Gallery, a music room, meeting room, for use of cultural groups, and a fireproof room for the Library's growing collection of Yukoniana.

With a book stack of 85,000 books the Library was able to service 55 outlets in the various Yukon communities. 16,000 books were shipped to these outlets and 8900 new books were catalogued. Membership increased to 4,500 and Whitehorse citizens circulated 45,900 books during the year. The Library's monthly exhibits from the National Art Gallery has brought to Whitehorse a wide spectrum of art-photography ranging from ornamental brasses to op art.

Liquor Department

Sales for the period from April 1st, 1966 to December 31st, 1966 amounted to \$2,337,279. as compared to \$2,006,171. for the corresponding period in 1965, an increase of \$331,108.

Public Health

Northern Health Service, Medical Services Branch of the Department of National Health and Welfare, provides advisory and technical assistance and personnel on a cost-shared basis with the Government of the Yukon Territory to offer comprehensive Public Health coverage. The administration of the Public Health Ordinance and Regulations is carried out by the Zone Director.

The year saw to fulfillment the major objectives of the first Five Year Plan and a continuing Health Services Plan has been declared for the period 1967-72 through which it is hoped to make further advances.

The construction of a Health Centre at Teslin is envisaged in the forthcoming year and portable Health Stations are to be located at Carmacks, Pelly Crossing and Burwash Landing.

The Yukon Public Health Service has twelve personnel including a Travelling Medical Officer, Public Health Nurse, a Health Officer and Registered Dental Nurse.

Territorial Department of Game

A total of 265 non-resident big game hunters were licensed in the Yukon during the hunting season, an increase of 5 hunters over the 1965 season and of 55 over the 1964 season. The above figure is made up of 247 foreign hunters and 18 Canadian hunters.

With the market price of fur increasing slightly in the early winter an increase in activity has been shown by trappers especially adjacent to settlements. There are in excess of 300 registered traplines.

Department of the Territorial Treasurer

The Public Accounts of the Territory for the fiscal year ending March 31, 1967, will, when available, reflect the expansion of Territorial Government services that has been experienced in recent years. Budgetary expenditures are expected to be as follows:

Operation and Maintenance	\$8,241,549.
Project and Loan Capital	3,162,044.
Loan Amortization	408,707.

Revenue and recoveries are expected to be as follows:

Operation and Maintenance	\$5,604,533.
Project and Loan Capital	1,452,180.
Loan Amortization	77,743.

The operating deficit grant receivable from the Federal Government will amount to \$1,858,794. and the loan amortization grant to \$686,580.

Current surplus is expected to be in deficit to the extent of \$5,925,456 offset by loan amortization grants to be received from the Federal Government totalling \$7,311,546.

Public Administrator

The main function of the Public Administrator, is to attend to the Administration of the estates of deceased persons, act as trustee of the estates of persons who are committed to Mental Institutes and to act as official guardian and trustees of funds held for minors.

During the year administration was concluded of 44 deceased estates and 17 Insane Estates. Funds held in trust during the year amounted to \$122,243 with disbursements amounting to \$95,444. Securities in the value of \$40,950 and the number of shares in Companies having a variable market value was \$17,409.

THE COUNCIL OF THE NORTHWEST TERRITORIES

Responsibilities: To exercise legislative powers comparable to those of a province.

Long-term Plans

The enactment of legislation comparable to that of a province and in keeping with changing conditions: gradual evolution toward provincial status with a representative and responsible government.

Review of 1966 Operations

The Northwest Territories steadily advanced towards a more representative form of government. As a result of a change in the Northwest Territories Act the elected membership on Council was increased from four to seven and three additional constituencies were created: Central Arctic, Keewatin and Eastern Arctic. Elected to Council in a September by-election were Duncan Pryde (Central Arctic); Robert Williamson (Keewatin) and Mr. Simonie (Eastern Arctic). Mr. Simonie was the first Eskimo elected to Council.

The Carrothers Commission on the Development of Government in the Northwest Territories recommended Yellowknife as the Capital of the Northwest Territories; an increase in the number of elected members to 14; retention of four appointed members; the Deputy Commissioner's responsibilities be increased so that eventually he will fill the role of Premier and the Commissioner's status to be equal to that of a Deputy Minister and eventually be equivalent to Lieutenant Governor; the transfer of various functions from Federal to Territorial Government and the establishment of various departments; the Territorial Government situation be reviewed again in ten years and further consideration be given to acquiring full provincial status.

The 32nd Session of Council convened January 24 at Ottawa and prorogued February 7. Council's general recommendation was that the Northwest Territories should evolve into full provincial status in four stages over 10 or 12 years with gradual Territorial assumption of present Federal responsibilities and with Federal assistance for economic development. Eight bills were passed including five amendments, one new Ordinance and two Appropriation Ordinances.

At the 33rd Session, in Resolute, in October and November, there were 25 bills, 15 Recommendations to Council, 19 Sessional Papers. This was Council's longest and busiest session. The Council unanimously approved the Carrothers Commission Report and urged the Minister of Indian Affairs and Northern Development to implement it as quickly as possible.

Much of the Session was devoted to legislation and consideration of sessional papers involving the proper utilization of game resources and plans for improvement of housing in the north.

A lack in Territorial labour legislation was at least partially met by the passing of the Fair Practices Ordinance and a new Workman's Compensation Ordinance consequent upon the adoption of a Report of an Enquiry on the subject. A report of an Enquiry on Labour Standards was discussed but was held over to the next Session.

Council accepted the Commissioner's recommendation that a Territorial Housing Corporation be established to administer the various housing programs, and to facilitate co-operation with other agencies in the implementation of the National Housing Act.

One highlight of the Session was the maiden speech by Mr. Simonie, Eastern Arctic, delivered entirely in Eskimo.

Commissioner B.G. Sivertz announced his retirement plans.

Since the approval in 1963 of a comprehensive corrections program for the Territories, a correctional institute and camp have been built at Yellowknife. Madame Vanier formally opened these institutions on September 12, 1966. In addition a detention unit for delinquent girls was established in Fort Smith.

Twenty-four houses have been built in Yellowknife and it is expected a twenty-four unit apartment will be completed by the spring of 1967. The houses and apartment building together with four houses constructed in Fort Smith are being occupied by Territorial Government employees.

A women's residence is being successfully operated by the Y.W.C.A. of Canada on behalf of the Territorial Government.

The Alcohol Education Program is now underway but it is not expected that there will be any apparent results in the immediate future.

During the year there was a considerable increase in Territorial Government Officers (Director of Personnel, Director of Corrections, Director of Alcohol Education, Housing Administrator, Centennial Officer and other senior field officers such as Correction Officials and a Fire Inspector).

Plans for 1967

On January 18, 1967, the Minister of Indian Affairs and Northern Development named Yellowknife the capital of the Northwest Territories. The Minister indicated all efforts would be made to transfer the Commissioner's Office and other essential services to Yellowknife by freeze-up. The turn-over of programs and duties from Federal to Territorial will be gradual in order to avoid disorganization and interruption of long term planning.

NORTHERN ADMINISTRATION BRANCH

Responsibilities: To undertake, promote, and recommend policies and programs for the further economic and political development of the Territories.

Education Division

Development and operation of a school system for the Northwest Territories and Arctic Quebec. Provision of vocational education, including apprenticeship and an employment service, as well as adult education in these areas. Development and implementation of the new orthography for the Eskimo language. Operation of a combined vocational - secondary school and pupil residence in Yellowknife and an occupational training centre and pupil residence in Fort Churchill, Manitoba. Responsibility for the pupil residences in the Territories which are operated under contract by the Anglican and Roman Catholic Missions. Administration of assistance programs for higher education.

Engineering Division

Planning for and design of structures; construction and maintenance of roads, buildings, and utilities; operation of power plants, water and sewerage systems, heating plants, and other electrical and mechanical equipment, provision of engineering assistance for settlement and town planning; site and soil investigations, investigation of northern building problems; provision of engineering assistance to the government of the Northwest Territories and the Yukon Territory.

Industrial Division

Improvement of economic conditions by encouraging better harvesting of food resources, developing cottage, secondary, service and primary industries and co-operatives. Area surveys of renewable resources on which to base future planning. Development of the tourist industry in the Northwest Territories.

Territorial Division

Provision of administrative assistance to the Government of the Northwest Territories; acting for the Federal Government on the negotiation of

federal-territorial financial arrangements; administration of Territorial Ordinances; provision of advisory services on Yukon affairs; specific activities in the Northwest Territories including game management, hospital insurance, labour, municipal affairs, liquor management, housing administration, forest management, and administration of territorial lands. The latter two activities are a federal responsibility and are carried out in relation to both the Yukon and the Northwest Territories.

Welfare Division

Provision of welfare services to all residents of the Northwest Territories on behalf of the Federal and Territorial Governments, and to the Eskimos of Arctic Quebec and Manitoba. Operation of Children's Receiving Homes at Yellowknife, Fort Smith, Inuvik, and Frobisher Bay, a Home for the Aged at Aklavik, and transit centres at various northern points. The development and operation of a Corrections Service in the Northwest Territories. Provision of an Eskimo-English translation service. Stimulation of cultural and social development of northern ethnic groups. Provision of advice on Yukon welfare matters as required.

Finance and Management Advisory Division

Financial and accounting matters, property management, procurement and supply, administrative procedures, and office services in Ottawa.

Field Organization - Northwest Territories

The field organization is divided into two administrative Districts. The Mackenzie District, with headquarters at Fort Smith, has three Regional offices supervising eight administrative areas. The Arctic District, with headquarters in Ottawa, is made up of three Regions containing a total of sixteen areas. The Area Administrator reports to the Region Administrator; the Region Administrator reports to the District Administrator; and the District Administrator reports to Headquarters in Ottawa.

Long-term Plans

Education Division

To expand academic, technical, and vocational education programs, and to increase new school construction to provide facilities for the entire

school-age population of the north. To institute a program of learning for children at the pre-school age level. Vocational counselling and employment services are being expanded. Continuation of the program to encourage Indians and Eskimos to seek education beyond the secondary school level. To conduct an in-school and an adult program of instruction in the use of the new orthography for the Eskimo language. There will be an expansion of adult education in conjunction with housing development programs as well as the development and operation of broad new programs.

Engineering Division

To continue design and research in the provision of better and more economical buildings and facilities for the Northern Administration Branch; to be responsible for and to administer the roads and airfield construction programs of the Yukon and Northwest Territories; to facilitate the transfer of the engineering function to the Government of the Northwest Territories and to assist the Government of the Northwest Territories to undertake this function when the guidelines for transfer are established.

Industrial Division

To increase the level of economic development in the north through a program of assistance to secondary, service, and some primary industry. To support traditional resources harvesting activities through the provision of technical assistance in harvesting and marketing of products; to improve the level of investment by private enterprise through a program of feasibility studies, financial assistance, and general service; to develop projects where no private investor can be found and to turn these over to private concerns when their feasibility has been proven; to develop and provide a technical assistance program to northern people who are operating private concerns and are handicapped by a lack of formal education or ready communication with the southern business community.

Territorial Division

To develop federal-territorial policy and fiscal arrangements and to give assistance to the governments of the Territories in the exercise of their responsibilities. To develop and administer Branch housing policies. To develop a northern forest management plan and to encourage the development and utilization of the forested areas. To recommend and implement policies for the disposal of Crown lands in both Territories.

Welfare Division

To develop suitable programs of social security, public assistance, and related services for family and child welfare; to assist native people in meeting economic and social changes associated with the decline of traditional ways of life, and with the shift to wage employment and life in the settlements; to encourage citizen participation in the solution of local community problems, and in the general management of community affairs; to promote the social, economic, and cultural advancement of northern residents.

Review of 1966 Operations

Education Division

Programs were enlarged and facilities increased in the Northwest Territories and Arctic Quebec as part of the continuing objective to provide educational opportunities for all residents of the Northwest Territories and for Eskimos in Arctic Quebec. Higher education assistance was expanded considerably with 43 applicants receiving \$36,000 in financial assistance. Adult education was initiated in the Arctic District as a component of the Eskimo Rental Housing Program. Enrolment at Vocational Training institutions, inside the Territories and out, was increased considerably and the program for apprentices continued very successfully with the number of apprenticeable trade increased to 25. An Eskimo Linguistics Section was added to the Division. Total 66/67 education expenditure was \$36 million, and enrolment was 7,800 students.

Engineering Division

A five-year plan (1967-71) for topographic mapping in the Northwest Territories and the Yukon Territory was prepared and forwarded to the Department of Energy, Mines and Resources for implementation. Fifteen sites were vertically photographed, precise ground control established at nine, and seven legally surveyed. Town planning studies were continued in twenty settlements, final reports being received for Broughton Island, Cambridge Bay, and Igloolik. Architectural plans were prepared for houses, apartments, a hostel, warehouses, an industrial arts shop, a liquor store, minimum security camps, extensions to schools, and an administration building. A number of buildings were purchased including 382 houses, 9 portable classrooms, 9 three-bay garages, 4 power houses and a minimum security correctional camp. In addition contracts were awarded for the construction of 2 classrooms, 3 apartment units, an office, and transient quarters. Construction of larger buildings and

facilities was arranged through the Department of Public Works. The Fort Smith Highway was completed (except for crushed rock surfacing). Some work was carried out on the extension of the Pine Point Highway to Fort Resolution. On the planned Ingraham trail (Yellowknife to MacKay Lake) reconstruction of Mile 16-20 was partially completed. A two-year 50 mile contract was let for the extension of the Mackenzie Highway to Fort Simpson from Mile 117 to 167. The Salt River Bridge on the Fort Smith - Pine Lake Road was replaced and equipment purchased for construction of an access road from Coral Harbour to Snafu Beach. The fire hall at Pine Point was completed and contracts let for fire halls at Fort McPherson and Fort Norman. An extension to the Inuvik fire hall neared completion and the design for a fire hall for Cambridge Bay was completed. Work continued on water and sewer systems at Aklavik and Fort Norman.

Industrial Division

The operation of various projects was continued. Four co-operatives and one credit union were incorporated during the year. A tannery project was established at Aklavik. Materials for seventeen houses were produced at the Aklavik pre-cut housing factory. A study of ways and means of stimulating economic development in the Northwest Territories was carried out under contract over a two-year period and a completed report produced. The Delta logging and lumbering industry was reorganized and the mill moved from Aklavik to Arctic Red River where better stands of timber are available. Area surveys were completed in the Mackenzie Delta, Rae - Lac la Martre, Cumberland Sound, and Baffin Island areas.

Territorial Division

Assistance to the Governments of the Yukon and Northwest Territories was continued. The Division took a central role in Federal-Territorial financial arrangements for both Territories, administration of Northwest Territories Ordinances, provision of advisory services on Yukon affairs, specific activities in the Northwest Territories, including game management, hospital insurance, labour, municipal affairs, northern housing, liquor management, forest management, and administration of Territorial lands.

Welfare Division

In the Arctic District decentralization of case work services was completed. Welfare services included repatriation of more than 1,000 discharged patients, the operation of transient centres to accommodate Eskimos on their way to and from southern Canada, the care of children in foster homes, visits to Eskimos confined to institutions, and the provision of other services.

In the Mackenzie District the administration of Indian welfare programs was transferred from the Indian Affairs Branch. There was an increase in the number of cases of child neglect and in the amount of social assistance provided.

Plans for 1967

Plans for 1967 include the continuation and extension of programs being carried forward by each Division, decentralization of the Northwest Territories administration, and the negotiation of Federal-Territorial Financial Agreements to replace those which expire on March 31, 1967. For details see plans set out under "The Administrator of the Arctic" and "The Administrator of the Mackenzie".

THE ADMINISTRATOR OF THE ARCTIC

Responsibilities: To implement in the Arctic District the policies of the Department as directed by the Northern Administration Branch headquarters.

Long-term Plans

Long-term plans are dependent on departmental policy.

Review of 1966 Operations

Organization

Three Regional Headquarters were maintained. The Regional Office at Churchill supervised area offices at Eskimo Point, Whale Cove, Rankin Inlet, Baker Lake, and Coral Harbour. The Frobisher Bay Regional Office supervised area offices at Broughton Island, Cape Dorset, Igloolik, Pangnirtung, Pond Inlet, and Resolute Bay, the last mentioned being established in September. Regional Headquarters for Arctic Quebec continued to operate in Ottawa, supervising area offices at Great Whale River (Poste-de-la-Baleine), Port Harrison (Inoucdjouac), Povungnituk, Sugluk (Saglouc), and Fort Chimo.

Housing

One hundred and ninety-four prefabricated three-bedroom houses were shipped to nine communities of the Frobisher Region as the first phase of the new low rental housing program. Each house is to be serviced with electricity (as soon as practicable), fuel oil, and sewage disposal and water supply. Administration of maintenance funds will be the responsibility of local tenant associations under contract to the department.

Engineering

Despite the scarcity of skilled manpower in the south, approximately 100 qualified tradesmen were hired for northern construction projects, and to support the construction crews about 200 Eskimos were employed as tradesmen, helpers, and labourers. Forty-two residences for government staff, 13 classrooms, two office transient quarters, a new Arts and Crafts Centre, garages, powerhouses, warehouses, power lines, utilidors, and a 105,000-gallon bulk oil storage tank were erected.

Because of new construction, new customers, and the low rental housing units, the electrical load in many settlements exceeded the generating capacity of the power stations. Sixteen additional diesel generators were therefore installed and put into operation. These varied in size from 25 KW units to 250 KW units. The total installed generating capacity of the departmental power stations was increased by 1,900 KWs. To meet the difficulty of finding skilled power plant operators, a new concept for the operation of departmental power stations was developed by the Engineering Section and, as a result, three power stations in the Frobisher Bay Region are now equipped with automatic load-sharing and load-transfer apparatus.

The department purchased from Northern Canada Power Commission a large 250 KW Lister diesel generator located at Knob Lake. N.C.P.C. moved the diesel generator and accessories to the airstrip where it was loaded in an R.C.A.F. Hercules and flown to the Fort Chimo airstrip. I.A.N.D. and D.O.T. bulldozers moved it from the airstrip to the new powerhouse addition about a mile and a half away. A Montreal firm provided technicians to install the unit, while departmental construction staff built the powerhouse extension, pads, and transformer sub-station.

In Rankin Inlet the inadequate utilidor system was replaced by a new one and approximately 26,000 feet of new piping was installed. Two 150-foot dykes were built, creating a reservoir of sufficient capacity to hold approximately 60 million gallons of water.

An experimental water distribution and sewage collection system for ten houses in a new development area of Frobisher Bay was installed. Water and effluent circulate continuously through a looped pipe system connecting all 10 houses. Electric heating cables and hot water heat exchangers keep the system from freezing.

Consulting engineers completed their investigation of water and sewage systems for Pond Inlet and Pangnirtung.

Education

One hundred and nine elementary classrooms, one high school classroom, ten special classrooms, and three vocational shops were in operation in 31 schools. The total enrolment was 2,575 pupils, of whom 2,353 were Eskimos and 31 Indians. This includes those attending the Churchill Vocational Centre. In addition, 91 Eskimos from the Territories, Arctic Quebec, and Akudlik attended the Duke of Edinburgh School, Churchill.

More than 150 Eskimos were enrolled in special vocational courses at the Churchill Vocational Centre. Training was also carried out in the north in handicraft management, fabric painting, fur grading, sawmill operation, boat building, carpentry, and guide training. Eskimos came to southern Canada for instruction in carpentry, heavy equipment operation, commercial art, commercial subjects, baking, marine mechanics, plumbing, equipment mechanics, and handicraft management. Seventy Eskimos from the District received training in provincial technical institutes or trade schools, and 89 Eskimos were given special courses in the north. There was no difficulty in placing these Eskimos in employment.

In June, ten contract employees were sent to the Frobisher region to conduct adult education classes with chief emphasis on the Housing Program. By the end of September they had completed their assignments in the settlements concerned - Frobisher Bay, Pangnirtung, Broughton Island, Cape Dorset, Hall Beach, Pond Inlet, Igloolik, and Arctic Bay, and 600 people had participated.

An experimental kindergarten program was established at Frobisher Bay.

During February, in-service training programs were conducted for teachers at regional conferences held in Frobisher Bay, Churchill, and Quebec City. A workshop for Eskimo Classroom Assistants in the Keewatin Region was also held at Churchill in February.

Welfare

Early in the year a Social Worker was assigned to Fort Chimo to supervise the social services for the five settlements in the area where the need for professional services had become acute. In October the first welfare administrator joined Welfare staff and was assigned to the Churchill Regional office. The terms of his employment provide that after two years on the job he will be encouraged to continue his education for a Master's Degree in social work, after which he will accept employment with northern welfare service for a further two years.

In April social services to Eskimo patients in Moose Factory General Hospital and the Toronto Hospital, Weston, Ontario, were turned over to the Frobisher Bay and Arctic Quebec Regional Superintendents of Welfare. With the transfer of responsibilities for these services, and repatriation of discharged patients from Montreal in November, the decentralization of case work services to the regions was completed.

Welfare functions included many personal interviews with Eskimo patients in hospitals in Southern Manitoba, Ontario, and Quebec, as well as repatriation of more than 1,000 discharged patients. Transient centres to accommodate Eskimos on their way to and from southern Canada were operated at Churchill, Frobisher Bay, and Hall Beach.

All Eskimos in the Rideau Industrial Farm and in institutions for the retarded were visited during the year. One hundred children were in foster homes and three others were committed to the care of the Superintendent of Child Welfare. Institutional or boarding home care was provided to twelve adults. Plans were made for retraining two blind persons, and rehabilitation services were provided for four others following treatment for tuberculosis. In northern communities social assistance issued to families was essentially for reasons of poor health, old age, dependent children, or unemployment. Applications for allowances under other programs were processed for those eligible.

As in the past nine years, a Welfare team consisting of a Social Worker, an Assistant, and an Interpreter accompanied the Medical Patrol on the CCGS "C.D. Howe". Payne Bay and George River were serviced by air. This, with the elimination of the long stop at Resolute Bay, shortened the patrol by approximately two weeks. In planning for the evacuation of 54 patients, the Social Worker arranged for the care of 67 children because one or both parents went out to hospital. The Occupational Therapy Program was reduced as the majority of patients spent only two or three days on board and were evacuated from the nearest point where an aircraft could meet the ship. Many flew south direct from their home community. Improved air mail service enabled reports by mail to relatives in hospitals rather than by ships. Fourteen tons of dog food donated by the Humane Society were distributed.

Industrial

Endeavours to stimulate local economies were largely successful and resource harvesting activities ranged from the production of cod fillets at Port Burwell to the mining of substantial quantities of soapstone in Keewatin. The fisheries produced 87,000 pounds of dressed Arctic Char and 18,000 pounds of Atlantic salmon for retail markets and local consumption, and 46,000 pounds of whale products for processing into human food, and processed 81 whales for dog food.

The relocation of the cannery at Rankin Inlet was completed, and 57,000 pounds of specialty food products were processed. In Arctic Quebec trap boats and canoes were built from local lumber and the entire output was immediately sold. In the Keewatin Region the sale of arts and crafts brought an income of nearly a quarter of a million dollars to the Eskimos involved.

The 13 Co-operatives provide a variety of services to their membership, including housing, retail stores, arts and crafts production and marketing, fish and fur production and marketing, bakeries, restaurants, and clothing manufacturing. Most of these activities stem from the general economic development program undertaken by the department. The Design '67 Award, granted by the National Design Council and the Department of Industry, was won by the West Baffin Co-operative at Cape Dorset for their fabrics design.

The second conference of the Arctic Co-operatives, held in April at Povungnituk, considered mutual problems, put forward new ideas, and discussed the merits of a central marketing agency for all northern co-operatives.

Two Eskimo men were hired as assistants to the Resources Development Officers at Rankin Inlet and Port Burwell. Both have taken an active part in the development programs in their respective areas.

Tourist Development Officers from the Arctic District as well as the Mackenzie, represented the Northwest Territories at Sportsmen's shows in Chicago and Minneapolis. They were assisted by two Eskimos from Baker Lake and Cambridge Bay. The N.W.T. display was viewed by some 500,000 people at Chicago and 275,000 at Minneapolis.

A twenty guest tourist camp was built at Rankin Inlet. Tourist promotion for the N.W.T. included writers' tours to the Keewatin for films and articles for the United States, photographs and material from Frobisher Bay for Expo '67, and promotion for the Eskimo owned and operated tourist camp at George River (Port-Nouveau-Quebec).

Plans for 1967

It is planned to erect, under the Housing Program, 182 units in the Keewatin and 158 in the Frobisher Region. Another major project will be the

construction of a road between Snafu Beach and Coral Harbour. To keep up with the rising demand for electricity, a minimum of 600 KW of generating capacity must be provided, and in some settlements the power plants will be doubled or tripled. To cut down on line losses and low voltage conditions, power distribution facilities will be boosted from 600 to 4,160 volts in at least three settlements. Preliminary reports indicate that 46 staff residences will have to be erected as well as six extra classrooms and a number of warehouses, powerhouses, etc. The bulk of the construction program, however, will be the 340 Eskimos low rental houses.

Plans are underway for the construction of a 20-bed children's home at Frobisher Bay. A one-room school will be established at Hall Beach and the kindergarten program begun in 1966 at Frobisher Bay will be expanded to provide kindergartens at five additional settlements.

On February 27 an exhibition was held in Toronto City Hall to display the ceramics produced at Rankin Inlet. It was the first showing of this type of work produced for the first time by the Eskimos in the Northwest Territories.

Plans are underway for three new tourist camps - at Eskimo Point, Whale Cove and Baker Lake. A tourist facilities guide book for the Arctic District is scheduled for publication.

Resource Development Officers will be positioned at Pangnirtung and Igloolik to aid local development, and a Co-operative Development Officer will be posted to Rankin Inlet to help foster co-operative development in the Keewatin Region.

THE ADMINISTRATOR OF THE MACKENZIE

Responsibilities: To implement in the Mackenzie District the policies and programs of the Department, as directed by Northern Administration Branch headquarters.

Long-term Plans

Long term plans are dependent on departmental policy.

Review of 1966 Operations

Organization

The Mackenzie District is composed of three Regions, all administered by the Central District Office in Fort Smith. The Inuvik Regional Office supervises two Area Offices in Aklavik and Tuktoyaktuk and new Area Offices in Fort McPherson, Fort Good Hope, and Fort Norman. The Cambridge Bay and Spence Bay Area Offices are supervised by the Yellowknife Regional Office. The Fort Smith Regional Office supervises Area Offices in Fort Smith, Fort Simpson, Hay River and a new area in Pine Point.

Land and Municipal Affairs

Plans for community centres and centennial projects are in progress in 10 settlements and municipalities; a centennial ball park and townhall in Hay River, Library in Inuvik, community halls in Rae and Fort Simpson having been completed. Land subdivisions in Hay River and Yellowknife continued while assessment work at Fort Simpson and Inuvik was completed. Over 45 proposed amendments were reviewed prior to revision of the Municipal Affairs Ordinance. There was improved liason with Engineering personnel with regards to settlement planning and much advisory aid was given in this respect to Inuvik in its preparations for village status.

Forestry

The fire season saw 248 fires burning an area in excess of 541,000 acres and costing \$678,000; the cost per fire was reduced 30% due to improved operational efficiencies. The Mackenzie Forest Service administers

the Territorial Timber Regulations and sawlog production was doubled; total wood utilization was 1.3 million units. The Service operated fifteen tourist campsites.

Game

Although fur prices generally showed a marked increase over 1965 fur revenue decreased by \$400,000 due to a drop in seal prices. Non resident sport hunting was very successful with 170 hunters participating, benefiting the economy with money being spent on aircraft charters, supplies, and guide services. A guide training course was held in co-operation with the Vocational Education division. Implementation of the Trappers Assistance Program is providing a more stable economy for the trapper's population.

Surveys made included; the Bathurst Inlet caribou calf herd, a survey on the feasibility of re-introducing caribou to Southampton Island as a local food service the Coates Island caribou crop, surveys to determine polar bear quotas and the sport hunting of muskox. A Mackenzie Delta beaver survey resulted in more beavers taken and a \$25,000 gain to the trappers. A buffalo vaccination program for 700 animals, was carried out in the Hook Lake area.

Education

There were 5,217 students enrolled at the commencement of the 1966-67 term, an increase of more than 5%. This is made up of 4,261 students in Federal Schools and 956 students in the Yellowknife Public School District and the Separate School Districts at Yellowknife and Hay River.

The School system totalled 273 classrooms comprised of 171 elementary, 61 secondary, and 41 special classrooms. A new 5 room school was opened in Fort McPherson. Under the Territorial Higher Education Plan 44 students from the Mackenzie District received financial assistance to attend universities. A total of 220 students were assisted in attending vocational courses outside the Territories. Ninety-one vocational trainees attended unrecognized institutions, 81 being instructed within the Northwest Territories. Ten Territorial students who are physically handicapped receives special education in the provinces. Thirty-four apprentices were given financial assistance to attend courses at provincial institutions.

Industrial

The logging and milling complex at Aklavik was moved to Arctic Red River. Logging operations were suspended in mid-December owing to weather conditions.

The Fur Garment Industry has been steadily increasing, new markets have been developed for Arts and Crafts, and a full time contract supervision has been appointed to the Coppermine area. Three Co-operatives at Pelly Bay, Gjoa Haven and Hay River and one credit union at Aklavik were formed.

A Tourist Information Bureau with a seasonal staff of three was initiated during the summer at the Alberta border of the Mackenzie Highway.

Welfare

In July welfare programs administered by Indian Affairs Branch in the Northwest Territories were amalgamated with the Northern Administration Branch. In this transfer of responsibility present staff had to perform additional duties. This resulted in weakened coverage in a number of places and an acute staff problem.

The Child Welfare Program continued its rapid expansion with more child neglect cases coming to light and more children taken into care.

The Social Assistance Program reached a plateau with regard to Eskimos and Territorial residents. With the amalgamation of Indian Affairs assistance is now provided to Treaty Indians.

The Community Development Program continued to receive acceptance among community councils, advisory councils, and Indian Bands. Some confusion is being experienced in attempting to co-ordinate this program with other programs in the District.

Housing

Housing surveys have been completed in 25 settlements in the Mackenzie District. The information compiled from these surveys gives an accurate picture of the number of housing units required in each settlement. A total of 69 Territorial mortgages were registered during 1966. Nine of these were discharged or cancelled leaving a total of 60 active.

Indian Affairs

Effective July 1, certain functions and responsibilities of the Indian Affairs Branch were transferred to the Northern Administration Branch

in the Mackenzie District. Indian Agencies at Fort Smith, Yellowknife, Fort Simpson, and Aklavik were withdrawn and the Regional Office at Fort Smith was reduced to conduct residual responsibilities. These include; Band memberships, Indian Estates, Treaties, Enfranchisement, Revolving Fund Loans, Cultural Affairs Program, Regional Indian Advisory Council, Community Development Program, and the Indian Affairs Scholarship Program.

Engineering

The Engineering Division has increased responsibilities in both the maintenance and construction fields, due to Indian Affairs amalgamation. Over one hundred housing units were constructed as part of the Indian Affairs housing program. Twenty-two Welfare housing units are being constructed throughout the Inuvik Region, using local materials.

The Fort Smith highway was completed and is maintained by the Department. Twenty-five miles of the Fort Simpson highway have been completed.

Two settlements were relocated to areas where planned expansion is possible. Fort Wrigley was moved across the river to a new site by the airport and Holman Island was moved across the bay where building conditions are much superior.

Other projects completed during the year include:

- 20 - 3 Bedroom houses
- 16 - Portable classrooms
 - 1 - Major School
 - 4 - Additions to existing schools
 - 3 - Warehouses
 - 2 - Powerhouses
 - 2 - Powerplant installations
 - 2 - Distribution Systems
 - 6 - Buildings for R.C.M.P.
- Miscellaneous projects for D.P.W.

Plans for 1967

Forestry

The zone of fire protection will be re-evaluated to correlate suppression

costs to timber values protected. This extended zone will require a look-out tower at Nahanni Butte, and new buildings at Inuvik, Porter Lake, and Fort Resolution. One of the fifteen operational campsites will be turned over to the town of Hay River, four new campsites will be constructed, and a tourist information booth will be erected near the 60° parallel for the 1967 season in co-operation with the Industrial Division.

Game

Surveys will be made of fur bearing animals, and big game to determine the possibility of fine fur habitual improvements. Caribou will be introduced to Southampton Island in conjunction with Canadian Wildlife Service. A Trapper and Conservation Education Program will be initiated and recommended changes in the Game Ordinance and Regulations introduced.

Education

A 12 room secondary school in Hay River, a 16 room school in Inuvik, and a 7 room school in Coppermine will be built. Additional schools are in the planning stage for Yellowknife, Cambridge Bay, Aklavik, and Morphy (Rae).

Welfare

Due to Indian Affairs amalgamation, an increase in staff will be necessary in order to maintain adequate service in the Mackenzie District.

Housing

By February 1, all Civil Service housing records will have been taken over by the District Housing Officer. Low cost rental housing will be taken on April 1, with the master records of all Mackenzie District rental housing being handled by this officer.

Engineering

The Inuvik Region Welfare Housing Project is to be completed. Ten million dollars of road construction is planned. Most of it extensions to the following roads: Mackenzie Highway west towards Fort Simpson, Ingraham

Trail east from Yellowknife, Pine Point towards Fort Resolution, and Ross River - Carmacks Road. The Fort Smith Highway is to have all the subgrade completed and graveling started. Reconstruction work on the Boudary Road north west of Dawson and on the Whitehorse-Keno Road is to be done in the Yukon, and a start made on the Carmacks to Onion Creek Road.

NORTHERN CO-ORDINATION AND RESEARCH CENTRE

Responsibilities: To sponsor and conduct research on northern subjects, to encourage northern research by non-governmental agencies, to co-ordinate departmental and inter-departmental research, to collect and disseminate technical and scientific information on the north, and to operate the Inuvik Research Laboratory.

Long-Term Plans

To assist in the development of the Canadian north by encouraging scientific and technical investigations. To provide adequate laboratory and other facilities in the north for the use of scientists from government departments, universities, and elsewhere.

To administer an expanded program of grants to northern research institutes and northern scientific expeditions. To undertake a program of research directed towards northern needs and particularly in the social sciences.

Review of 1966 Operations

Facilities for Scientific Research in the North

The Research Laboratory at Inuvik, including an annex for cosmic-ray measurements, was opened in early 1964 and provides general laboratory and other facilities to support a variety of scientific disciplines. The Laboratory, contains low-temperature rooms and special arctic experimental facilities in addition to general laboratories, photographic dark room, library, offices, and seminar rooms. The manager and small technical staff provide assistance in support of scientific investigations throughout the year.

Seven of the abandoned intermediate DEW Line stations have been reserved for use as required for scientific purposes.

Northern Research Program

The Centre conducts a continuing program of northern research, mainly but not exclusively in the social sciences. Much of this research is undertaken by university scientists and graduate students working under contract or as seasonal employees.

The primary focus of attention was on the Mackenzie Delta Research Project, a multi-discipline program designed to isolate and analyze social and economic conditions which impede native peoples from participating in northern development, and to assess the extent to which they are making effective adjustment to changes brought about by government and commercial expansion in the north.

The Mackenzie Delta was chosen as a research site because it is broadly representative of the physical, social and economic conditions in the Canadian Arctic and Sub-Arctic. The program was initiated in the spring of 1965, when four studies were undertaken by a team of specialists in anthropology, economic geography, and technology. These studies were designed to provide the general background data necessary to establish the location of key areas for detailed investigation during the second phase of the program. The second phase, begun in the spring of 1966, sought to explore in greater depth those important problem areas which previously had been identified. The following studies were initiated:

- (1) A study of the attitudes, values, perceptions, and motivations of native people in the rapidly changing socio-economic environment of the Delta.
- (2) A study of relations among sub-groups within the native population of the Delta.
- (3) A study of the employment potential and development possibilities in the Delta, as this relates to an expanding population, higher levels of education, and an increasing level of expectation in living standards.
- (4) A psychological study of the factors that determine basic personality development, with special emphasis on the formation of personality structure effective in dealing with changing needs in the socio-economic environment.

- (5) A study to isolate and evaluate the social and physical components significant for town planning in the Delta.
- (6) Preparation of a working bibliography to assist continuing scientific investigation in the Delta.

In addition to the work of the Mackenzie Delta Project, a number of other projects were initiated or continued, among them the following:

- (1) A comparative study of Eskimo administration in northern Canada, Alaska, Greenland, and Labrador.
- (2) A study of the role of sled dogs in the changing economy of the population of the eastern Arctic.
- (3) A bibliography of publications dealing with the design, specifications, and production of Arctic clothing.
- (4) Participation with the Defence Research Board in the organization and conduct of hovercraft trials in the Mackenzie Delta, for the Advisory Committee on Northern Development.

Grants Programs for Northern Research Institutes and Scientific Research Expeditions

During the fifth year of the program of assistance to northern research institutes and northern scientific expeditions, amounts totalling \$200,000 were awarded, as recommended by the Grants Committee to the Minister. Through the grants program a large number of northern research projects were supported, in a wide variety of scientific disciplines. Grants were made to:

Arctic Institute of North America
 Arctic Studies Group (L'Université de Montréal)
 Boreal Institute (University of Alberta)
 Canadian Research Centre for Anthropology (University of Ottawa)
 Centre d'Etudes Nordiques (Université Laval)
 Committee on Arctic and Alpine Research (University of British Columbia)
 Committee on Northern Studies (University of Manitoba)
 Institute for Northern Studies (University of Saskatchewan)
 President's Committee on Northern Area Studies (Lakehead University)

Institute of Social and Economic Research (Memorial University)
McGill Committee for Northern Research (McGill University)
The Somerset Island Expedition (University of Ottawa)
The Devon Island Expedition (Arctic Institute of North America)
The Icefield Ranges Research Project (Arctic Institute of North America)
The Yukon Research and Development Institute

A grant of \$30,000 was also made towards the cost of publications of the Arctic Bibliography.

Reports

Five reports were issued during this year, and a number of others were being prepared for publication.

Plans for 1967

The Inuvik Research Laboratory will provide facilities for an increasing number of scientists.

In the third phase of the Mackenzie Delta Research Project, emphasis will be directed toward communicating to all interested persons and agencies the specialized understandings gained by research into the problems of the area, and toward translating the findings of the study into general recommendations for government policy. Emphasis will also be placed on the development of methods to continue evaluating the local situation.

The following studies are being proposed, and will be carried out to the extent that availability of funds and qualified scientific personnel allow:

- (1) A study in the Mackenzie Delta of local attitudes toward social assistance programs and similar welfare measures, in order to provide an objective and comprehensive view of the meaning of "welfare" for local people.
- (2) A study of Athabaskan language as a factor shaping the perceptions of native peoples in the Mackenzie Delta, in

a situation of rapid social change. This reasearch would be concerned with analyzing linguistic problems in cross-cultural communication, and its undertakings would depend upon the availability of a competent linguist.

- (3) A study of culture-change problems in the Delta, as they are perceived by transient white residents.
- (4) A study of problems associated with the relocation of Eskimo families to places of employment outside the Arctic.
- (5) Continued compilation of a working bibliography to assist scientific investigation in the Mackenzie Delta.
- (6) Continued participation with other government agencies in studying the suitability of hovercraft for northern transportation.

RESOURCE AND ECONOMIC DEVELOPMENT GROUP

Responsibilities: To provide policy advice and develop specific programs for furthering the economic development of the Yukon and Northwest Territories.

To formulate, recommend and implement policies and programs for the management and administration of Crown mineral rights in the Yukon and Northwest Territories.

To effect liaison with other divisions of the Department, other departments and agencies in the Federal Government, the Territorial Governments and universities, industries, and other organizations in relation to resource and economic development of the Yukon and Northwest Territories.

To administer safety Acts and Ordinances in relation to mineral extraction industries.

Review of 1966 Operations

OIL AND GAS

Land Disposition

A total of 1,239 Canada Oil and Gas Permits covering 59,493,900 acres were issued; of this, 860 permits covering 41,767,299 acres were in the mainland Northwest Territories; 316 permits covering 14,237,559 acres were in the Arctic Islands of the Northwest Territories; 9 permits covering 517,748 acres were off the Arctic Coast and 54 permits covering 2,971,294 acres were in the Yukon Territory. The total acreage under permit and lease on December 31, 1966 was as follows:

Permits

Northwest Territories (Mainland)....	2,018	95,898,807
Arctic Islands (N.W.T.).....	1,434	65,272,723

Yukon (Mainland).....	309	14,575,623
Arctic Coast.....	199	9,625,591
		<hr/>
TOTAL.....		185,372,744
		<hr/>

Leases

Northwest Territories (Mainland).....	151	882,481
Yukon (Mainland).....	17	75,359
	<hr/>	<hr/>
TOTAL	168	957,840
		<hr/>

Three cash bonus permit sales were held during the year. A total of 59 permits were sold realizing \$5,079,836.17.

Nineteen blocks covering 94 grid areas were disposed of realizing a work bonus commitment totalling \$2,028,441.33.

A work bonus must be expended on exploratory work during the first term of a permit in order that the permittee may obtain a refund of the bonus.

Exploration

Mainland

Ten geological field parties carried out extensive surface investigations in the sedimentary ranges of the Mackenzie and Richardson Mountains in the Northwest Territories, the Eagle Plain in the Yukon, and in the Great Bear Lake - Great Slave Lake areas. Helicopter and fixed-wing support aircraft are now being utilized to a degree where all supplies and personnel are being transported by air. All field investigations are carried out by helicopter supported parties.

The number of geological parties engaged in surface mapping is decreasing every year since most of the major oil companies have completed their preliminary mapping programs. The majority of the

work is now carried out by consultants working for a client, or for their own information which is later sold to oil companies on a non-exclusive basis.

Light mobile seismic equipment adapted for transport by helicopter continued to be utilized over muskeg and highly dissected terrain during the summer months. Though the operating costs are higher than the conventional wheel-and-track-mounted seismic equipment, on a mileage basis or shot-point basis the costs are comparable because of increase in production. Furthermore, operations can be carried out continually during the whole year.

A new record in "footage drilled" on Canada lands was set. Twenty-nine wells, totalling 123,061 feet, were completed or abandoned. One well is yet uncompleted, it appears that it might prove to be the most significant gas discovery in western Canada in 1966. It was drilled in the Pointed Mountain area of the Northwest Territories, about 25 miles north of the B.C. border. The well is presently undergoing production tests; preliminary indications are that the well will rank in size with a well of similar capacity in the Beaver River area of north-east British Columbia.

Arctic Islands

Two geological parties conducted surface investigations in the Arctic Archipelago. The work was concentrated in the central region between Resolute and Eureka.

An aeromagnetometer survey and interpretation conducted by Hunting Survey Corporation covering most of the central and western Islands was completed during the year. Oil companies holding permits in the Islands covered by the survey can purchase these data for work credit purposes.

A company conducted extensive seismic surveys in Prince Patrick and Mackenzie King Islands. All the equipment and supplies were flown to the Arctic Islands from Edmonton by transport plane.

The use of large fixed-wing aircraft, particularly the Hercules, is increasing every year, and at the same time is being used in many varied roles. For example, the seismic equipment and base camp were flown out from Prince Patrick Island to Inuvik by Hercules aircraft of Alaskan Airlines. A similar aircraft is on order by Pacific Western Airlines and delivery is expected on March 1, 1967.

Publications

The Fifth Schedule of Wells 1963-65 was completed. This schedule contained geological and drill testing information on wells completed to the end of 1963 and non-confidential data of all wells completed in 1964 and 1965. Various specialized maps were printed for sale to the public and several new information circulars were distributed to the oil industry.

MINING

Northwest Territories

Continued high interest has been shown in the Pine Point area and exploratory programs consisting of geophysical, geochemical surveys and diamond drilling of anomalous areas continued in 1966. Additional ore bodies have been outlined in this area and negotiations for the combining of some separately-owned properties are underway.

There was a revival of interest in the Coppermine area and fairly heavy staking continues.

The Yellowknife Recorder's Office again experienced a record year, over 21,000 claims being recorded.

Baffinland Iron Mines Limited has completed a feasibility study of its high grade iron showings on Baffin Island. Further studies, sponsored by the Federal Government are underway.

Cominco and Bankeno Mines Ltd. carried out drilling and geochemical investigations on claim groups and prospecting permit areas on Little Cornwallis Island.

Project Circle has drilled a number of holes on a copper showing to the north of Great Slave Lake.

PCE Explorations, Consolidated Proprietary Mines, and Roberts Mining are active in the Coppermine area and negotiations are underway for joint exploration efforts on promising showings.

Coronet, Dynacore Explorations, Slave Explorations, Quatsino Copper-Gold Mines, New Privateer Mines, Four Point Mines as well as Cominco are actively interested in the Pine Point area or are acquiring further claims prior to instituting exploration programs.

The following are preliminary figures of mineral claims recorded and comparative figures for 1964 and 1965.

<u>Mining District</u>	<u>1964</u>	<u>1965</u>	<u>1966</u>
Mackenzie	3,949	14,985	21,247
Nahanni	76	48	783
Arctic & Hudson Bay	352	459	413
	<hr/>	<hr/>	<hr/>
TOTAL	4,337	15,492	22,443
	<hr/>	<hr/>	<hr/>

The value of mineral output for the year again showed an appreciable increase over the previous year, mainly due to the increased production from Pine Point Mines.

Pine Point Mines Ltd. continued to ship highgrade lead-zinc ore to smelters throughout the year. However, with the completion of the concentrator in November 1965, the bulk of shipments was in the form of concentrates.

Production at the four producing gold mines, namely Giant Yellowknife Mines, Con-Rycon, Discovery, and Tundra Gold Mines continued at a normal rate.

Silver and copper production again showed a substantial increase and was mainly due to the production from Echo Bay Mines on Great Bear Lake who operated for the second full year.

Canada Tungsten's operation in the Flat River Area was proceeding well until the Mill fire of December 26th halted production. It is anticipated that a new improved plant will be ready by the end of 1967.

The following table gives preliminary production figures and comparative figures for 1965:

TABLE 1

MINERAL PRODUCTIONNORTHWEST TERRITORIES

<u>Mineral</u>	<u>Quantity</u>		<u>Value</u>	
	<u>1965</u>	<u>1966*</u>	<u>1965</u>	<u>1966*</u>
Gold	452,479 oz.	417,841 oz.	\$ 17,071,580	\$ 15,752,606
Silver	1,064,824 oz.	1,952,634 oz.	\$ 1,490,754	\$ 2,731,735
Lead	165,662,547 lbs	230,000,000 lbs	\$ 25,677,695	\$ 34,362,000
Zinc	189,380,626 lbs	360,000,000 lbs	\$ 28,596,474	\$ 54,360,000
Tungsten	3,736,324 lbs	3,973,000 lbs	\$ 3,115,909	\$ 3,226,910
Copper	942,400 lbs	1,617,882 lbs	\$ 354,342	\$ 726,429
Cadmium	185,840 lbs	200,000 lbs	\$ 516,635	\$ 480,000
			\$ 76,823,389	\$ 111,639,680

* Preliminary Figures

YUKON TERRITORY

The staking activity in the Ross River area continued and some 10,000 claims were recorded.

Anvil Mining Corporation has been formed to plan and, it is hoped, put into production the Faro lead-zinc deposit originally discovered by Dynasty Exploration Ltd. Kerr-Addison Mines Ltd. continued evaluation work on the Vangorda and Swim Lake deposits.

About 30 other companies are actively prospecting in the area and it is estimated that \$5,000,000 was spent on exploration in 1966.

Atlas Exploration had the largest program, apart from Anvil, based on Ross River and extending into the central plateau region. They have discovered a possible new base metals belt in the Sheldon area.

Yukon Antimony Corp. Ltd. suspended underground investigations of its antimony showing and will now concentrate exploration on its Skugum Creek copper showing.

Hecla Mining Co., Silver Titan Mines, and Silver Key Mines are investigating silver-lead showings at Bunker Hill, Mt. Haldone, and in the Ketz River district.

Sphere Development Corp. will explore 4 asbestos prospects in the Clinton Creek area, originally optioned by Cassiar Asbestos and Canadian Johns-Manville.

New Imperial Mines Ltd. is still drilling to increase reserves. Production from the initial open-pit is planned to commence in April of 1967 and contracts have been signed with White Pass and Yukon to truck and rail-haul bulk concentrates to Skagway by container. White Pass and Yukon plan to spend \$1,000,000 on container-transfer facilities at McCrae and storage and ship-loading facilities at Skagway.

Cassiar Asbestos is proceeding on schedule with the preparation for production from its Clinton Creek asbestos deposit. Production is planned for late 1967 or early 1968.

The following preliminary figures show the claims recorded with comparative figures for 1965:

<u>Mining District</u>	<u>1965</u>	<u>1966</u>
Whitehorse	5,508	9,240
Mayo	899	718
Dawson	297	854
Watson Lake	698	4,620
	<hr/>	<hr/>
TOTAL	7,402	15,432
	<hr/>	<hr/>

With the coming into production of New Imperial Mines Ltd. the declining trend in the value of mineral production in the Yukon should be halted in 1967. Discovery Mines closed down early in 1966 and Yukon Consolidated Gold Corporation had phased out its dredging operations by the end of the year.

Yukon Coal Company continued normal production throughout the year.

The following preliminary table shows the quantity and value of mineral output in the Yukon and comparative figures for 1965:

TABLE 2

YUKON TERRITORY

<u>Mineral</u>	<u>Quantity</u>		<u>Value</u>	
	<u>1965</u>	<u>1966*</u>	<u>1965</u>	<u>1966*</u>
Gold	45,031 oz.	40,035 oz.	\$ 1,698,975	\$ 1,509,320
Silver	4,615,995 oz.	4,078,223 oz.	\$ 6,462,393	\$ 5,705,434
Lead	17,851,309 lbs	16,373,000 lbs	\$ 2,766,953	\$ 2,446,126
Zinc	13,247,653 lbs	9,086,000 lbs	\$ 2,000,396	\$ 1,371,986
Cadmium	138,918 lbs	105,824 lbs	\$ 386,192	\$ 253,978
Coal	8,801 tons	6,000 tons	\$ 85,626	\$ 60,000
TOTAL			\$13,400,535	\$11,346,844

* Preliminary Figures

In both Territories \$27,000.00 was spent for Prospectors' Assistance under the Prospectors' Assistance programs. Prospectors participating in these programs totalled 17 in the Yukon and 28 in the Northwest Territories.

DEVELOPMENT ANALYSIS

In support of the Group's responsibility for evaluating natural resource exploration and development projects, the Section carried out technical analyses of the following projects:

Anvil Mining Corporation	Yukon
Baffinland Iron Mines Ltd.	N.W.T.
Canada Tungsten Mining Corp. Ltd.	N.W.T.
New Imperial Mines Limited	Yukon
Mount Nansen Mines Limited	Yukon

To provide an improved means of carrying out these evaluations, a computer program was developed for determining cash flow, rates of return and royalty and income tax calculations for mining projects.

A study to determine the feasibility of providing smelting facilities for lead and zinc in the Pine Point area was initiated and carried out by a consultant.

A program to provide financial assistance for oil and gas and mining exploration in the north (known as the Northern Mineral Exploration Program) was put into effect and met with encouraging response from the industry.

ECONOMIC STAFF GROUP

Among the major projects undertaken or initiated have been a general review of the Yukon economy and work relating to more intensive study of the Yukon; studies of transportation routes in the Yukon and Northwest Territories; a survey of labour skills in the N.W.T., and a review of problems relating to market access in various parts of the north.

Plans for 1967

OIL AND GAS

Interest should remain high in the area south of Fort Providence - Fort Simpson and between the Alberta and British Columbia border. A total of 20 wells may be drilled in this area during the current year.

Interest should continue on a high level in the Peel Plateau area of the Yukon and Northwest Territories.

Several oil companies will be conducting seismic operations in the Mackenzie Delta - Yukon Coastal Plains area in preparation for a well to be drilled some time in 1968 and 1969.

The final draft on the Oil and Gas Production Conservation Act has been completed and it is hoped that it will soon be introduced in Parliament. If the legislation is enacted regulations will be prepared for seismic operations.

Schedule of Wells Number 6 will be published. This will contain information on all wells drilled to the end of 1966 and geological and engineering data for wells drilled to the end of 1964. Information brochures and reports on topical items will be prepared during the course of the year.

MINING

The tote road assistance program will be continued with \$100,000.00 available in each Territory in the 1967/68 fiscal year.

Further assistance is available for access roads, early exploration and pre-production and early production phase aerodromes.

The Federal Government has approved the Northern Mineral Exploration Assistance program whereby loans totalling \$3,000,000 annually may be made to Companies engaged on approved exploration programs. The agreements entered into under this program provides for repayment of the loan only if a mine is developed as a result of the explorations carried out.

DEVELOPMENT ANALYSIS

Further studies will be carried out on the Baffinland Iron Mines and Anvil projects.

The Pine Point Smelter feasibility study will be assessed.

The administration of the Northern Mineral Exploration Program will continue and amendments to the Program will be recommended.

A study of mining royalties in the Yukon and Northwest Territories will be made.

Working in conjunction with the Northern Administration Branch, the Section will continue to provide advice on federal participation in the cost of building roads and airstrips in the north.

ECONOMIC STAFF GROUP

This Section will plan and undertake investigations and special studies on all phases of the northern economy. These plans include a program to ensure that adequate statistical data are collected and collated. It will provide economic advice to departmental management on northern matters and participate in northern economic policy and program formulation.

Work will continue on all the projects begun in 1966 and on the development of basic statistical records and series bearing on all facets of the northern economy. The Section will continue to act in the capacity of liaison between the Department and the Dominion Bureau of Statistics with a view toward improvement of, certain statistical coverage for the Yukon and Northwest Territories.

DEPARTMENT OF JUSTICE

DEPARTMENT OF JUSTICE

Responsibilities: Giving legal advice, preparing Draft Ordinances, and advising and assisting on the administration of justice in the Territories, including the organization and maintenance of territorial courts of civil and criminal jurisdiction; the appointment of judicial officers, Justices of the Peace, Magistrates, and Juvenile Court Judges; the direction and conduct of court proceedings on behalf of the Crown, including prosecutions under the Criminal Code and the Territorial Ordinances.

Review of 1966 Operations

Legal advice on a number of problems was given. Draft Ordinances were prepared. Criminal proceedings were conducted by Crown Counsel, when necessary, before the respective superior courts, Justices of the Peace, and Police Magistrates, the last-mentioned also acting where appropriate as Juvenile Court Judges.

Proceedings which were not held in the larger centres were dealt with by local Justices of the Peace or when appropriate by the Magistrates and Superior Court justices on circuit. The day-to-day administrative duties respecting the courts were carried out by the clerks of the court and sheriffs.

Plans for 1967

To continue to discharge the Department's functions as outlined above without substantial change.

CANADA DEPARTMENT OF LABOUR

CANADA DEPARTMENT OF LABOUR

Responsibilities: Conciliation and other services for maintaining good industrial relations; administration of the fair wages policy, fair employment practices, annual vacations with pay, and female employees equal pay legislation; sale and administration of government annuities; compensation to government employees for occupational injury or illness; surveys of wage rates, hours of labour, and other working conditions.

Long-term Plans

Normal planning to meet responsibilities.

Review of 1966 Operations

Industrial Relations

Representation Proceedings: The Canada Labour Relations Board processed 18 applications from trade unions for certification of bargaining agents for units of employees of companies operating north of the sixtieth parallel. Fourteen of the applications affected units of employees in the Yukon Territory, two affected units of employees in the Northwest Territories and two affected units of employees covering locations in both the Yukon and Northwest Territories.

Conciliation and Arbitration Proceedings: Two industrial disputes were mediated involving companies and trade unions in the Yukon Territory. There were no disputes in the Northwest Territories.

Accident Prevention and Compensation

Claims of federal government employees, regularly working in the Yukon and Northwest Territories, for compensation for occupational accidents or diseases were received, adjudicated, and paid by the Alberta Workmen's Compensation Board under a federal-provincial agreement. A total of 585 claims was received and disbursements were \$81,400.

Economics and Research

The Economics and Research Branch conducted two annual surveys--one on wage rates, salaries, and hours of labour, the other on working conditions--covering 25 establishments in the Yukon Territory and 35 in the Northwest Territories. These two regions were included in a special survey on the distribution of employees in industries under federal jurisdiction by wage rates in connection with the Canada Labour (Standards) Code and in a preliminary survey of the extent of collective bargaining among professionals. The Branch also maintained a file of collective agreements covering employees in these areas.

Annuities

No statistics are available on the number of government annuities sold in the North but it is believed to be small. Sales and other business relating to government annuities were carried out by correspondence.

Winter House Building

Under the 1965-66 Winter House Building Incentive Program four applications were submitted from the Yukon Territory but only two houses were built. Although fourteen applications were submitted by the Northwest Territories one house only was built. The Winter House Building Incentive Program was not in operation during the winter of 1966-67.

Fair Wage Schedule

Sixty-eight "fair wage" schedules in the Northwest Territories and 36 in the Yukon were established for federal government construction contracts. Also 176 recommendations were made for establishing wage rates for prevailing rate of employees of the federal government in the Northwest Territories and 126 in the Yukon Territory.

Plans for 1967

Normal operations.

**DEPARTMENT OF MANPOWER
AND
IMMIGRATION**

DEPARTMENT OF MANPOWER AND IMMIGRATION

IMMIGRATION DIVISION

Résponsibilities: Implementation and administration of the Immigration Act and Regulations in the North as elsewhere in Canada, including admission of immigrants, non-immigrants, returning Canadians and returning residents, and deportation. In implementing the policy of the Government in respect of immigration, Immigration has an active part to play in promoting the development of the economy of the North as well as of the country as a whole.

Long-term Plans

To develop immigration programs designed to provide increasingly close support to the particular development needs of each region of Canada.

Review of 1966 Operations

There were 30 ports of entry operative in the far North. One was a full-time Immigration office, six were Customs offices and the remainder were maintained under an arrangement whereby officers in charge of R.C.M.P. detachments, heads of certain Canadian meteorological stations, and commanding officers of certain R.C.A.F. stations have been designated as Immigration Officers in Charge and Special Inquiry Officers to administer the Immigration Act and Regulations. At these ports of entry 128,791 persons were examined comprising of 36 immigrants, 10,500 returning residents and 118,255 non-immigrants. During 1966, 215 persons admitted to Canada as immigrants, at the time of their examination gave their destination as either the Yukon or the Northwest Territories. Of these, 120 were workers and the remainder were dependants. In the same period 89 immigrants were placed in employment in the Yukon and Northwest Territories by Immigration officers.

The Medical-Welfare Agreement between the Federal Government and the Northwest Territories, covering assistance to immigrants who became indigent through accident or illness during their first year's residence in Canada was continued.

Plans for 1967

On February 1 the Immigration activities at the one full-time Immigration Office in the far North will be taken over by Customs and Manpower officers. The Customs officers will carry out the port of entry examinations and administer the Immigration Act and Regulations. Manpower officers will assess the opportunities for the settlement of immigrants and take over all job placement and employment counselling activities in the North, as well as throughout the rest of Canada.

MANPOWER DIVISION

Responsibilities: The development and utilization of manpower resources by counselling, relocation, training, and placement of individuals who are assisted in their search for more productive participation in the economy and in developing their maximum potential, and by assisting employers in meeting their labour needs through response to their orders and the matching of supply of and demand for workers.

Long-term Plans

The services of the Canada Manpower Centres will be made available to people either in the communities where they live or as close to them as is practically possible. Depending on available resources, sub-offices and itinerant services are planned for smaller communities, including frontier towns and Indian settlements. Consideration is being given to more intensive and co-ordinated services in collaboration with the Departments of Indian Affairs and Northern Development, Transport, Health and Welfare, etc., to assess the manpower needs of the area and to develop responsive programs to meet those needs.

Review of 1966 Operations

The Canada Manpower Centre in Whitehorse, serving the Yukon Territory, received during 1966 a total of 1,669 employers' orders representing 2,335 vacancies; and made 2,089 referrals which resulted in 1,592 placements. New registrations for jobs totalled 1,595 and renewed registrations 1,966. At present 129 trainees, including 3 apprentices, are reported to be undergoing trades and occupational training under Program 3 (Adult Occupational Training). Under Program 5 (Training for Unemployed), 129 adults received training during 1965-66. Federal contributions under the Technical and Vocational Training Agreement for the period 1965-66 were \$138,310. This included a small amount of additional equipment for approved schools.

The Northwest Territories is presently serviced from Edmonton and Winnipeg. Separate data on placement operations is not available.

A total of 194 trainees, including 59 apprentices, are reported to be receiving training under Program 3. There were 37 trainees enrolled in Program 5 courses during 1965-66. In addition to the 66 trainees reported under Program 4 (Training in Co-operation with Industry), 4 new projects, mainly in the field of Heavy Duty Equipment Operation and Maintenance, were initiated for 12 additional trainees. Federal contributions under the Technical and Vocational Training Agreement for the period 1965-66 were \$227,879. This included a small amount of additional equipment for approved schools.

Plans for 1967

The regional manpower office in Winnipeg responsible for the Northwest Territories plans to establish a full-time Canada Manpower Centre in Hay River and a sub-office in Yellowknife. With the designation of Yellowknife as the territorial Capital, it is anticipated that the sub-office there will soon become a full-time Canada Manpower Centre. It is expected that itinerant services will also be started to the eastern parts in the Keewatin and Franklin Districts. Another immediate objective is to provide staff for liaison between officers of the Edmonton and Winnipeg Manpower Centres and the selection and placement officers of Department of Indian Affairs and Northern Development.

A "full-service" centre in Whitehorse will soon be a reality. Special emphasis will be placed on the development of the labour force through vocational training, apprenticeship, and training in industry.

DEPARTMENT OF NATIONAL DEFENCE

DEPARTMENT OF NATIONAL DEFENCE

CANADIAN ARMED FORCES

Responsibilities: Support of Canada's external and defence policies in the North by contributing to the maintenance of Canadian sovereignty in the Arctic.

All aspects of maritime, land, and air defence of the North. In some areas of the North, these tasks are done in cooperation, or shared, with the USA under joint agreement.

Defence mapping of the North in cooperation with the Department of Energy, Mines and Resources.

Provision of Search and Rescue Services and Assistance to other Government agencies in areas where normal commercial services are not available.

Research into the problems of Arctic communications techniques and equipment. Stations are maintained in the North to participate in this research program and to undertake studies on radio transmission and reception problems in the northern area of Canada.

Long-term Plans

Continuation of present activities. Responsibilities and resources available to meet anticipated commitments and defence problems of the North are the subject of a continuing review. Continuation of the research program. Redeployment and improvement of facilities will include closing the stations at Whitehorse and Frobisher Bay and some expansion at Inuvik and Alert.

Review of 1966 Operations

Maritime Forces

No RCN ships operated in Arctic waters during 1966.

Two RCN clearance diving teams assisted in both Eastern and Western Arctic resupply during July, August and September.

Assistance was given in the resupply of Resolute Bay by surveying new landing areas and disposing of perished explosives during August and September. Water intakes at Alert were repaired. One RCN officer was loaned to the US Coast Guard for Eastern Arctic icebreaker and resupply operations.

Land Forces

Except for assistance given to the US in mapping and charting there were no significant exercises or operations by land forces.

Air Forces

Spring Resupply and Boxtop Phase 1. Two Hercules aircraft carried out 35 trips between 19 April and 1 May, from Resolute Bay and Thule to the Arctic weather stations. During this operation 90,350 pounds of general cargo and 435,000 Imperial gallons of fuel oil were lifted. Total flying time, including transit, was 397 hours.

Operation Boxtop. Two Hercules aircraft lifted 1,184,400 pounds of general cargo, 166 passengers, and 1,115,000 pounds fuel oil from Thule to Alert in 68 flights for a total flying time of 248 hours.

Fall Resupply. Two Hercules aircraft carried approximately 330,000 pounds of general cargo from Resolute Bay to the Joint Arctic Weather Stations between 13 September and 16 September. This airlift amounted to 66 hours flying time.

Christmas Airdrop. One Hercules aircraft flew 26 hours and airdropped mail and other items to 18 points in the Arctic. The total weight dropped was 19,540 pounds.

Search and Rescue. Ten major search and rescue missions, involving 3,962 flying hours, were carried out in the north. These missions, all in aid of civilian aircraft, are considered to have been instrumental in the saving of five lives. In addition to this figure there were several minor searches and mercy flights which involved the use of Search and Rescue aircraft.

Survival Training. Arctic survival training was conducted at Resolute Bay during the winter months. In addition to RCAF trainees, a number of representatives of foreign Services and civilian organizations such as the US Navy, IAND, RCMP, and DOT took part. An average of 25 personnel attended each of the six courses conducted.

Communications

Research and studies in radio transmissions and reception problems were continued at Frobisher Bay, Alert, Inuvik, and Whitehorse. In addition to its normal activities the station at Frobisher Bay provided communications support to the annual resupply operations in the Arctic. The major construction projects scheduled for Inuvik and Alert in the summer were deferred to 1967 for economic reasons. Minor alterations and improvements to buildings at Alert were carried out.

Mapping and Charting

Support was provided by the Mapping and Charting Establishment for the US Coast and Geodetic Survey Satellite Triangulation Program at Hall Beach, Yellowknife and Whitehorse. This program is aimed at providing a world-wide network of ground stations sympathetically coordinated by observations on satellites.

Plans for 1967

RCN Clearance Diving Teams will provide assistance to Eastern and Western resupply of DEW line sites.

Elements of 6 Signal Squadron will conduct an exercise at Frobisher Bay to test long distance communications under Arctic conditions.

Although not concerned with the Canadian North, Canadian land forces took part in a US exercise in Alaska during January and February, 1967.

Arctic resupply will be provided by C130 Hercules aircraft. The Spring and Fall Resupply operations to the JAWS sites and Exercise Boxtop (the resupply of Army and DOT at Alert) will comprise a total airlift of approximately 2,700 tons of bulk fuel and general cargo.

In addition it is planned to operate a C130 weekly as a scheduled flight from Namao - Resolute - Alert - Thule and return. A scheduled flight from Namao - Whitehorse - Inuvik and return twice monthly will also be continued.

The Mapping and Charting Establishment will carry out a 1:50,000 mapping task in the Ross River area in cooperation with the Department of Energy, Mines and Resources. The task will cover 80 maps and will employ 20 personnel for 3 months.

Support will be given again to the US Coast and Geodetic Survey Satellite Triangulation Program.

Canadian Forces Station Frobisher Bay will close down in June. A skeleton staff will remain until September to provide communications assistance for Arctic resupply operations. Communications support of resupply activities beyond 1967 is under review by the agencies directly concerned. The method of support in future years has not been decided at the present time.

Construction will be undertaken at Inuvik to expand and improve administration, accommodation, and recreational facilities; and at Alert to provide a new power generating plant and recreational facilities, and to improve accommodation and logistics support facilities.

DEFENCE RESEARCH BOARD

Responsibilities: To bring scientific knowledge and experience to the assistance of the Armed Services in solving problems of military operations in high latitudes. To sponsor and undertake research and technical projects of particular assistance to the Armed Services.

Long-term Plans

Research projects of two main types will be conducted: basic studies in the laboratory, and applied studies or field investigations. Almost every aspect of science is involved, with emphasis on factors, particularly cold, affecting the behaviour of man and his machines, and the physical sciences affecting communications, movement, and navigation in and under the sea, on land, in the air, and in outer space.

Review of 1966 Operations

The Defence Research Board conducted research projects on arctic and cold-weather problems through its Physics, Weapons and Engineering, and Biosciences directorates at Ottawa, the Defence Research Telecommunications Establishment at Ottawa, the Prince Albert Radar Laboratory, the Defence Research Medical Laboratories at Toronto, the Pacific Naval Laboratory at Esquimalt, the Naval Research Establishment at Dartmouth, and the Canadian Armament Research and Development Establishment at Valcartier. It also supported and coordinated research in the north by means of grants and contracts to universities, government agencies, and non-government research organizations. Close collaboration was maintained with research and development agencies in the United States and Britain.

Radio Physics

The telemetry station at Resolute Bay continued to record data from the Alouette I and II topside sounder satellites, launched in September, 1962, and November, 1965, respectively. All experiments in both

satellites continue to function well. Data from the U.S. Explorer XXXI satellite, which was designed as a complementary satellite and launched simultaneously with Alouette II, were also collected by the Resolute Bay station during part of the year.

Operation of this telemetry station is by Department of Transport personnel. The number of DOT staff has been decreased from six to four because of the termination of data collection from the Explorer XX satellite in December, 1965, and Explorer XXXI in May, 1966. One man is also supplied by the Defence Research Telecommunications Establishment (DRTE) for maintenance purposes.

Studies of the lower ionosphere were continued in the Canadian Arctic. The amplitude and phase of low frequency (LF) transmissions from several northern sites were recorded at Fort Churchill and Great Whale River. Two co-operative very low frequency (VLF) projects are being carried out, one with the U.S. Naval Electronics Laboratory, San Diego, and one with the Royal Aircraft Establishment. For these projects several VLF transmissions were recorded at Churchill and VLF transmissions from Aldra, Norway, were recorded in Ottawa.

The fixed frequency "partial reflection" HF sounders installed at Resolute Bay and Churchill continued in operation, taking routine observations at local mid-day, special observations throughout the day in spring and summer, and detailed observations during rocket launches by other agencies investigating the lower ionosphere. The sounding experiments have proven to be a most valuable means of studying the lower ionosphere by ground-based experiments, and discussions of this technique and its results formed the major portion of an international conference sponsored jointly by DRTE and the U.S. Air Force Cambridge Research Laboratory and held in Ottawa, 11-15 April.

The chain of riometer (relative ionospheric opacity meter) stations continued in operation. These instruments measure the changes in intensity of extra-terrestrial radio noise and provide a valuable routine monitor of geophysical and solar disturbances. Northern riometer stations were operated at Resolute Bay, Fort Churchill and Moosonee. Recordings were also made at the National Research Council field laboratory at Great Whale River for the Institute for Telecommunication Sciences and Aeronomy, Boulder, Colorado. DRTE

provides equipment for this station and duplicate recordings are made for our use. Frequent requests are received for riometer data, particularly for data recorded at Churchill for use in conjunction with data obtained from rocket-borne experiments. For example, during November a request was received and fulfilled for real-time warning of severe ionospheric absorption events in connection with the operation of Lunar Orbiter 2. Recently the NRC has installed an additional riometer at Churchill, due to the importance of this data.

Problems associated with medium frequency (MF) radiowave surveying systems in the Arctic were investigated at the request of the Polar Continental Shelf Project of the Department of Energy, Mines and Resources. It was found that the presence of a sheet of thick ice was the major factor in creating propagation (and hence survey) difficulties. A detailed analysis of some aspects of this investigation is being published in a DRTE report.

Geophysical Research in Northern Ellesmere Island

Field work was continued from the Defence Research Board's Tanquary and Hazen camps. A total of 25 scientists and assistants were in the field for varying periods between early April and late August. Logistic support was provided by the RCAF and by a light aircraft on commercial charter. Tanquary Camp was relieved and re-supplied by the CCGS John A. Macdonald in late August.

The Defence Research Board programme was centred on Tanquary Camp. Routine synoptic meteorological observations were made at the main camp throughout the summer, and further data were obtained from two unmanned meteorological stations at Van Hauen Pass and Lake Tuborg. Oceanographic reconnaissance work was continued on motor-toboggan traverses in Tanquary, Greely, Hare, and Otto fiords on the west coast, and in Disraeli Fiord and M'Clintock Inlet on the north coast; a total of 11 stations were occupied. Marine biological collecting was continued, and a programme for the measurement of acoustic attenuation in sea ice was started in Tanquary Fiord. A cooperative programme with the Smithsonian Institution (Washington, D.C.) for radiochemical sampling of sea and lake waters was begun.

In the field of glaciology logistic support was provided to the Scott Polar Research Institute (Cambridge, England) in carrying out successful tests of airborne depth-sounding equipment for measuring

the thickness of glaciers and ice caps. Mass balance studies were continued on a glacier near Tanquary Camp and on the Ward Hunt Ice Shelf.

During the course of the summer the airstrip on the old delta of the Macdonald River near Tanquary Camp was extended to nearly 4,000 ft. and widened to 120 ft. , with a view to the possibility of landing by large aircraft.

Under-ice Acoustics

Arctic ambient noise studies by the Pacific Naval Laboratory were continued. A field operation was carried out in April-May from Mould Bay to study the stability of the under-ice environment in terms of thermal structure, ice-generated noise, and acoustic back-scatter from the rough under surface of the ice. Development work was undertaken on a remote recording package for installation on the sea bottom. It is planned to install five of them in 1967 and leave them for a year.

Hovercraft Trials

Trials of an SR.N5 hovercraft, jointly sponsored by the United Kingdom and Canada, were carried out in April-June in the Mackenzie Delta area. Several Canadian agencies were involved, notably the Department of Indian Affairs and Northern Development, National Research Council, and Department of Transport, and the trials were coordinated by the Defence Research Board. A total of 71 hours operation was completed over ice and land surfaces, including an overland journey from Tuktoyaktuk, where the trials were based, to Eskimo Lakes, about 17 nautical miles to the south, and a trip up the Mackenzie River from Tuktoyaktuk to Norman Wells. On the latter journey, undertaken during break-up, conditions of rough moving ice were encountered with estimated obstacle heights of 5 to 7 feet, which resulted in some damage to the craft but did not render it unserviceable. A joint report by the conducting agencies was published by the Defence Research Board in October. Conclusions were that the capabilities of the hovercraft to operate in late winter and spring conditions in this part of northern Canada had been clearly demonstrated and that its future as a northern transportation medium should be further investigated.

Conjugate Point Experiment

A number of Canadian and United States agencies are carrying out

experiments at Great Whale River in conjunction with observations made at Byrd Station, Antarctica, its conjugate point. The Great Whale River station was originally established by the Pacific Naval Laboratory, who started the program in cooperation with Stanford University. It is now operated by the National Research Council, which also operates two All-sky cameras and a new auroral photometer.

Two Defence Research Board programs are involved. The Pacific Naval Laboratory is measuring micropulsations and ELF noise, and the Defence Research Telecommunications Establishment is monitoring the phase and amplitude of precise 80 kc/s transmissions from Ottawa.

Biting Flies

The cooperative Department of Agriculture - Defence Research Board project on the effects of extreme cold on the biology of insects was continued at Lake Hazen.

As a result of an exploratory study of residual DDT conducted at Fort Churchill in 1965, a more detailed investigation was approved, which will be carried out by the Defence Research Board in cooperation with the University of Western Ontario and the Canadian Wildlife Service.

An extramural study at the University of Manitoba resulted in the production of a key to the eggs of the Aedes species of mosquitoes found in central and northern Manitoba. Three species new to the province were identified. The project also resulted in the determination of developmental temperatures which will produce impotent male insects in 12 Aedes species. Female mosquitoes, obtained near Baker Lake, N.W.T., were shown to increase their egg production by a factor of 10 when given a single blood meal.

Environmental Physiology

The Climatic Suite at the Defence Research Medical Laboratories is continuing to work on physiological and metabolic responses to cold exposure in humans. Animal studies are continuing to investigate the effects of diet on metabolism and survival at various environmental temperatures.

Grants and Contracts

A number of extra-mural studies were supported by grants and contracts with universities and other non-government agencies.

Grants

- (1) To McMaster University for a study of methods of interpreting surface and sub-surface conditions in muskeg from air photographs.
- (2) To McMaster University for research on consolidation of peat under load.
- (3) To McMaster University for research on the dynamic response of a muskeg surface.
- (4) To McGill University for research on the engineering properties of frozen soil.
- (5) To the University of Ottawa for a study of the submarine geology and geophysics of Barrow Strait.
- (6) To Laval University for a study of the vehicle forces imposed by ice under confined conditions.
- (7) To the Arctic Institute of North America for a planning project for a study of the North Water.
- (8) To McGill University for a study of the attenuation of surface waves near pack ice.
- (9) To McGill University for research on wind and temperature characteristics of the stratosphere.
- (10) To York University for work on the reactions of the constituents of the upper atmosphere.
- (11) To the University of Saskatchewan for the support of research at the Institute of Space and Atmospheric Studies (formerly Institute of Upper Atmospheric Physics).
- (12) To the University of Western Ontario for research on the physics of the troposphere as related to UHF radio transmissions.

- (13) To the Canadian Military Services College, Royal Roads, for a study of the roles of the ionosphere and sun in the origin of the natural electro-magnetic background in the frequency range 0, 001 c/s to 100 Mc/s.
- (14) To the University of Western Ontario for studies on VHF radio wave scattering in the ionosphere.
- (15) To the University of Toronto for studies of the infrared emission spectrum of the upper atmosphere.
- (16) To the University of Western Ontario for support of ionospheric studies using satellites.
- (17) To Carleton University for studies of multiple-ion phenomena in the ionosphere.
- (18) To the University of Alberta for studies on the metabolic response of men in changing temperatures.
- (19) To the University of Toronto for studies of hypothermia and endocrine function, the biochemical mechanisms involved in cold adaptation, and the effects of cold on pharmacological reactions.
- (20) To the University of Manitoba for studies of vasospasm due to cold.
- (21) To the University of Ottawa for studies of endocrine functions of cold-exposed animals.
- (22) To Laval University for a study of circulatory adaption to cold stress.
- (23) To the University of Western Ontario for investigation of changes in muscle after cold acclimatization.
- (24) To the Research Institute of the Hospital for Sick Children, Toronto, for studies on hypothermia and rewarming shock.
- (25) To the University of Alberta for research on the flight range of biting flies.
- (26) To Queen's University for research on the reactive principles and specificity of bites of bloodsucking arthropods with particular reference to mosquitoes.

- (27) To the University of Western Ontario for a study of factors in the attractiveness of objects to adult Aedes aegypti.
- (28) To the University of Manitoba for research on the behaviour of biting flies with special reference to orientation and feeding.
- (29) To the Ontario Agricultural College for studies on the life history and ecology of Simulium rugglesi.
- (30) To the University of Alberta for an investigation of the mode of action of biting fly repellents.
- (31) To the University of Manitoba for studies on the effect of developmental temperatures in determining the southern limit of northern mosquito species.
- (32) To Queen's University for research to separate and identify the active principle of mosquito saliva.
- (33) To Queen's University for research on movements of P32 tagged adult black flies.

Contracts

- (1) With McGill University for research on ice physics, with special reference to the study of sea ice.
- (2) With McGill University for meteorological and geophysical work at Lake Hazen and Tanquary Fiord.
- (3) With the Arctic Institute of North America to provide limited consultant work.
- (4) With McGill University for a study of terrain evaluation and classification for mobility.
- (5) With McMaster University for research on muskeg trafficability.
- (6) With York University for spectroscopic studies of upper-atmospheric excitation, ionization, and re-combination processes.
- (7) With the University of Saskatchewan for research on radar aurora at UHF and its correlation with geophysical phenomena. This contract is in support of the experimental program of the Prince Albert Radar Laboratory.

- (8) With Queen's University for research on the susceptibility of blackflies to DDT, including field residues.

Plans for 1967

It is expected that the Board's program will be continued on approximately the same scale as in 1966.

NATIONAL FILM BOARD

NATIONAL FILM BOARD

Responsibilities: The production of motion pictures, filmstrips, slides and still photo stories about the Canadian North, its people and their activities, and its resources; arrangements for distributing this film material in Canada and abroad, including servicing northern posts and settlements; assistance to government agencies by advising in the use of visual media and in planning audio-visual programmes for informational and instructional purposes.

Long-term Plans

Production of films for the general public in Canada and abroad which will up-date their image of northern Canada in step with the development of the region.

Production of films for school audiences which will enable teachers to present an accurate image of Northern Canada and prepare those young people whose work will take them to the North.

Production of films for special audiences on behalf of the responsible government agencies: - to attract Canadian and foreign investment for northern resource development; to attract specialists such as doctors and teachers to the north; to provide teaching aids for Indians and Eskimos and films of social value for all northern peoples; to attract tourists, hunters and fishermen; training films related to northern development.

Gradual development of community film distribution services in the north which are appropriate to the stage of development of the various areas, - maintaining in the meantime a central outpost film service for the very small and very isolated places.

Review of 1966 Operations

- 1) Film Production: - The two films on northern resource development (RESOURCES INVENTORY and TRANSPORTATION AND COMMUNICATION) initiated in 1965 were shot and edited. They will be released in mid-1967.

A film to show Indian fishermen the methods required to obtain the quality of product needed for commercial success was shot and edited for the Department of Fisheries. A Cree language version is to be made in 1967.

An English version of a Russian film about the techniques of building on permafrost was in production at year's end for the National Research Council.

In the Board's interpretive programme, the following films were in production, but not all completed during the year:

ESKIMO ARTISTS - impressions of city life by two Eskimos working at Expo.

ESKIMO CHILDREN SERIES - eight of 13 planned films about the adventures of Eskimo life - intended for southern audiences.

GRENFELL MISSION - descriptive film

ESKIMO LIFE - set of 8 mm film loops for classroom social studies teaching.

A set of 35mm slides on ESKIMO LIFE was also made for use in southern schools.

Three newsreel stories were shot in the north and made available free on request to the theatrical and television newsreel producers everywhere:

GREAT SLAVE LAKE RAILWAY
PINE POINT MINING
FLY - IN FISHING (Little Campbell Lake, N.W.T.)

The last was also prepared in a revised form at the expense of the Canadian Government Travel Bureau for release in the series of "Televisits" which are provided as fillers to television stations, mainly in the U.S.A.

- 2) Still Photography: - In addition to the carrying out photography assignments in the north and adding new negatives to the library of the Stills Division, four photostories were published. These are offered to newspapers in Canada and abroad.

- No. 406 WITH THE CHRISTMAS STARS TO GUIDE THEM - an account of the R.C.A.F.'s air drop to Arctic outposts.
- No. 423 WILDERNESS WATERS - included rivers and lakes in the Northwest Territories.
- No. 425 ROCKETS AT RESOLUTE - a report of the firing of two scientific research rockets by the National Research Council.
- No. 433 YEAR-END REVIEW '66 - which included a photo of Simonie Michael of the Northwest Territories Council.

- 3) Film Distribution: - An extensive survey trip in the Mackenzie District was made by a distribution officer in April and May. Based on the result of that trip, recommendations were made to the Dept. of I.A. & N.D. regarding the educational film service in Mackenzie District and negotiations were initiated with the Territorial Government for a community film service, to be incorporated into the new territorial regional library.

An arrangement for distributing Centennial films in the north was developed with the co-operation of the Depts. of National Defence, Transport, I.A. & N.D., and the Centennial Commission.

The Winnipeg Public Library and the N.F.B. organized a film service to Dew Line stations.

A regular film service through Dept. of Transport facilities was begun providing film programmes to isolated and northern stations and vessels operating in the north. The programme emanate from Vancouver, Edmonton, Winnipeg, Montreal, Moncton and Dartmouth. Communities not on any northern film circuit are served from the Central Outpost Film Library at N.F.B. Operational Headquarters in Montreal.

**DEPARTMENT OF NATIONAL
HEALTH AND WELFARE**

HEALTH

Responsibilities: Northern Health Service

All responsibilities of the Federal Government in the field of health.

All responsibilities of the Territorial Government's in the field of health, undertaken by arrangements with these governments, except the hospital insurance program. These arrangements are subject to the sharing of costs between the Federal and Territorial Governments in approximate proportion to their respective responsibilities.

Consultative Services

Public Health Engineering, Epidemiology, Maternal, Child Health and Dental Health, etc. on request of the responsible authorities.

Long-term Plans

To develop Northern Health Services, to co-ordinate all medical and health services, and to co-operate with community health services in the same manner as would a department of health in a province. This system should, within the budgets of the interested agencies, provide for the types of health services most suitable for the unique distribution of population. To continue the operation of all existing government health and treatment units in the Territories and to develop new facilities, in co-operation with the Territorial Administrations, as and when the need for them is demonstrated and resources are made available.

Review of 1966 Operations

Good progress was made on the implementation of both the Yukon and Northwest Territories Health plans 1962-67. The new hospital at Yellowknife was completed in October. The old hospital was destroyed by fire on 22nd May and the fact that no loss of life or injuries occurred was due to the splendid efforts of the hospital staff and local residents.

The excellent cooperation of the Federal Emergency Health Service, the Emergency Measures Officer, the Alberta Provincial Emergency Health Services, and the R.C.A.F. resulted in an Emergency Hospital being air freighted into Yellowknife and this unit was in operation in the local Elks Hall within 24 hours of the disaster.

Two new mobile nursing stations were erected at Pond Inlet and Igloolik to serve the needs of these isolated areas. A twenty-four hour nursing service was instituted at Watson Lake Nursing Station to serve the impatient needs of this growing community. Accommodation for the extra staff required for this service was provided by the purchase of a mobile home.

All medical officer posts at all stations except Frobisher Bay were kept filled during the year and this resulted in a great increase in doctors visits to outstations and an accompanying higher standard of medical service to these communities.

Visits by specialists in the fields of pediatrics, internal medicine, psychiatry, and ophthalmology were much increased in both the Yukon and N.W.T. and the University of Alberta cooperated greatly by agreeing to provide a pediatric resident at Inuvik Hospital on alternate months. The policy of encouraging and subsidizing private practitioners in the Territories continued and private dental practitioners have set up practices at Fort Smith, Hay River, and Fort Simpson. Three young doctors were also encouraged to set up in practice at Fort Churchill which serves patients for the Keewatin area.

Public Health nurses for outstations were in short supply and it was not possible to recruit the full complement of staff. This is most unfortunate as without adequate staff in the isolated communities it is impossible to implement an effective public health program. Extra inducements will have to be provided for outstation nurses before adequate numbers can be recruited.

Administrative and clerical staff were also in short supply due to the disruption caused by reclassification of positions and the transfer of many of our staff to other departments.

The Pilot School Dental Project continued successfully in the Yukon Territory and appears to be one answer to the country-wide shortage of dental officers.

Child Guidance teams toured most areas of both Territories and have shown the need for improved mental health services in the Territories.

No serious epidemics were reported although there was a high evidence of influenza in all areas early in the year.

The Tuberculosis incidence for most areas was reduced but the Keewatin area has shown a sharp rise and figures similar to the epidemic of 1963 are expected.

Plans for 1967

Replacement of two older unsuitable nursing stations is planned for Coppermine and Fort McPherson, and a doctor's residence is planned for Watson Lake and a Health Centre for Teslin.

Increased specialists visits are envisaged and courses for Lay Dispensers and Community Health Workers are planned.

NATIONAL MUSEUM OF CANADA

NATIONAL MUSEUM OF CANADA

HUMAN HISTORY BRANCH

Responsibilities: Investigations relating to archaeology, physical anthropology, ethnology, folklore in Canada, Canadian history; and the collection, preservation, and display of specimens required for research and public information.

Long-term Plans

Normal Planning to meet responsibilities.

Review of 1966 Operations

Archaeology Division:

Archaeological research was conducted on Victoria Island, on Hudson Strait, about Great Slave Lake, in northern and southern Yukon Territory and at three Alaskan locations.

Ethnology Division

A staff ethnologist supervised the construction of a Caribou Eskimo kayak and skin clothing at Baker Lake.

A contracted ethnologist studied Eskimo community life in Labrador.

Plans for 1967

Archaeology Division:

Plans include archaeological research on Victoria Island, in interior Alaska, about Great Slave Lake, in the Yukon Territory and at Button Point. Physical anthropological research is planned for the Igloodik region.

Ethnology Division

Genealogical and linguistic work will be carried out at Repulse Bay and Igloolik by a staff member and assistant.

A contracted ethnologist begins a long termed economic study among the Eskimo of south Baffin Island in the Lake Harbour and Cape Dorset regions.

NATURAL HISTORY BRANCH

Responsibilities: Investigations relating to the botany, zoology, and vertebrate palaeontology of the north, and the collection, preservation, and display of specimens required for research and public information.

Long-term Plans

Normal planning to meet responsibilities.

Review of 1966 Operations

Field Participation

A study of the fresh water mollusks of the Hudson Bay drainages northwest of Churchill was conducted in July. Eighteen lakes between Churchill, Tulemalu Lake N.W.T. and Reindeer Lake were visited to collect mollusks, other invertebrates, and fishes and to study general lakeshore fauna. The mollusks have been incorporated in a monograph on "Fresh-water Mollusks of the Hudson Bay and Canadian Arctic Watersheds" which is now about 60% complete.

A study of fossil vertebrates of the Cretaceous badlands of the lower Horton River (200 miles east of the Mackenzie Delta) was carried out. Marine fossil vertebrates were discovered at three different levels in late Cretaceous sediments. In the lowest horizon bones of toothed birds (Hesperornis) were recovered in unprecedented abundance. Several kinds of mosasaurs and plesiosaurs were located in all three horizons.

Collections were made of Pleistocene fossil vertebrates in localities on the Stewart, Old Crow, Porcupine, and Eagle Rivers of the Yukon. The placer operations in the Dawson Mining District was another source. Mammoth, horse and bison are the most common fossils in the collections.

A mammalogy field party collected over 700 specimens in the Yukon. The areas studied were Bonnet Plume Lake, Keele Lake, Keno Hill, and Carcross.

Research Work - Arctic Marine Fauna

"Bryozoa of the Calanus Expedition, 1947-65" from the Canadian eastern arctic by Dr. N.A. Powell - This collection constitutes the largest, in terms of number of species, yet obtained from that area.

"Marine Gastropoda of the Calanus Expedition, 1947-65" by Dr. A.H. Clarke and Mrs. A. MacPherson. This report is nearing completion.

"Mammals of the Western Yukon" by P.M. Youngmen - Preparation of monographic study based on field work of previous five years progressing well, is scheduled for completion later in 1967.

"Marine Fishes of Arctic Canada" by Dr. D.E. McAllister - Revised key prepared, literature surveyed and bibliography published. "Canadian Fresh-Water Sports Fishes", including species of Arctic Regions, is in preparation.

Plans for 1967

A survey of fresh-water mollusks of lakes in the Severn and Hayes River systems (N.W. Ontario and N.E. Manitoba) and the Lake Mistassini area in N.W. Quebec.

Further explorations for Pleistocene mammal remains in various areas of the Yukon, including more detailed excavations at Pleistocene fossil localities on the Old Crow river.

Phycological investigations in the Arctic Archipelago.

NATIONAL RESEARCH COUNCIL

NATIONAL RESEARCH COUNCIL

Responsibilities: Investigations into various phases of pure and applied sciences in northern Canada.

Long-term Plans

Four Divisions of the National Research Council have a continuing interest in the North.

The Division of Pure Physics is involved in two major programs in northern Canada; ground based cosmic ray observations and rocket studies of charged particles associated with auroral events.

The Division of Building Research conducts studies of permafrost and northern building problems.

The Radio and Electrical Engineering Division carries out radio and optical observations of upper atmospheric phenomena, for example the aurora during minimum and maximum peaks of the sunspot cycle.

The Space Research Facilities Branch operates the Churchill Research Range and the Great Whale Geophysical Station.

Other Divisions of the National Research Council become involved periodically with northern work on a short-term basis.

Review of 1966 Operations

Division of Pure Physics

Continuous cosmic ray observations were carried out at five stations in northern Canada (Resolute Bay, Churchill, Alert, Inuvik, and Goose Bay). The purpose of this work is to study cosmic ray intensity variations and it is part of an international program carried out in collaboration with Atomic Energy of Canada Ltd., Chalk River, and the Southwest Center for Advanced Studies, Dallas, Texas.

Instrumentation was flown in four rockets launched from Fort Churchill during the year. These flights form part of a continuing program to study the charged particles which produce auroral events. The central problem is to determine what mechanisms accelerate the particles and where these mechanisms operate.

Division of Building Research

A small field station was established at Thompson, Manitoba in August when two staff members took up permanent residence there. Engineering and terrain studies of permafrost were begun at Thompson and in other areas of northern Manitoba. A co-operative program was undertaken with Manitoba Hydro to study problems associated with foundations for EHV transmission towers in permafrost. Field testing of a series of anchors installed in permafrost at Gillam, Manitoba was carried out in September and October.

Observations were made throughout the year and field surveys conducted during July and August at Inuvik to assess the foundation performance of various structures and the airstrip constructed on permafrost and the influence of construction and habitation on permafrost conditions. Special ground temperature and structural deformation instrumentation was installed during the reconstruction of the Inuvik wharf.

Studies of the thawing effect of water on the distribution of permafrost at a small lake near Inuvik and field observations on the performance of water retaining dykes constructed on permafrost at Kelsey in northern Manitoba were continued.

Compilation of a detailed map of permafrost distribution in Canada was completed. This map will be published in colour in 1967. Planning for a permafrost distribution survey by helicopter in northern Quebec was undertaken.

Field observations of building condensation problems were continued at Inuvik and a similar study was initiated at Thompson, Manitoba.

Radio and Electrical Engineering Division

Auroral and airglow phenomena observations were continued at Churchill using radar and photographic techniques.

Division of Biosciences

This Division is interested in the north as a source of psychrophilic bacteria. Samples were received from the Fisheries Research Board for bacteriological studies.

Space Research Facilities Branch

On January 1, the Council, through its Space Research Facilities Branch, took over the operation of the Churchill Research Range from the United States Air Force. Programs are continuing for the launching of sounding rockets and balloons to investigate geophysical phenomena in the upper atmosphere on behalf of scientists from Canada, the United States, and other countries. Associated ground based experiments are also carried out by the Technical Support Section at the Range.

Two sounding rockets were launched from Resolute Bay in July by the Space Research Facilities Branch with experiments for the University of Calgary and the Radio and Electrical Engineering Division of N.R.C.

The Space Research Facilities Branch has assumed responsibility for the co-ordination of various co-operative scientific programs at the Great Whale Geophysical Station.

Division of Mechanical Engineering

Studies of the icing conditions in Churchill harbour were completed. A report summarizing the results of the study, which indicated that the navigation season at Churchill can be extended by about 2 weeks, was prepared for the National Harbours Board. To achieve this extended navigation period economically and without upsetting the present estuary will require more study.

National Aeronautical Establishment

In 1963 and 1964 ten aeromagnetic profiles were flown between Canada and Greenland over that portion of the Labrador Sea and Davis Strait extending from Latitude 64°N in the North to a line joining the Strait of Belle Isle to the southern tip of Greenland in the South. During the period May 12 to June 1, 1966, nine additional lines were flown extending the surveyed area northward to Latitude 71°30'. In addition

ten lines were flown at 10 mile spacing off the coast of Labrador between Latitude 57°N to Latitude 60°N. This work is being conducted in co-operation with the Geological Survey of Canada. Its purpose is to investigate ocean floor spreading between Canada and Greenland.

From mid-April until early June, the National Aeronautical Establishment participated with other Government Departments in the joint U.K. - Canadian trials of an SRN-5 air cushion vehicle in the Mackenzie Delta area. These trials were sponsored by a special sub-committee of the Advisory Committee on Northern Development. The National Aeronautical Establishment assisted in planning the trials program, provided technical support for the trials, and participated in the preparation of the final report.

Plans for 1967

Division of Pure Physics

Both the studies of cosmic ray intensity variations at the five northern stations and the rocket program at Fort Churchill will be continued.

Division of Building Research

Permafrost distribution surveys will be conducted in western Quebec east of James Bay. Field studies of permafrost and the performance of engineering structures and facilities founded on perennially frozen ground will be continued at Inuvik, Thompson, and Kelsey. A detailed field testing program of EHV guyed tower anchors installed in permafrost at selected locations in northern Manitoba will be initiated. Attention to northern building superstructure problems will be maintained with specific observations on structures in which problems have occurred.

Radio and Electrical Engineering Division

Observations of upper atmosphere phenomena will be continued at Churchill.

Space Research Facilities Branch

Operation of the Churchill Research Range will be continued for the

launching of sounding rockets and balloons to investigate geophysical phenomena in the earth's atmosphere and in space on behalf of scientists from Canada, the United States and other countries.

Two sounding rockets will be launched from Resolute Bay in September by the Space Research Facilities Branch as a continuation of the experimental study carried out in 1966 by the University of Calgary and the Radio and Electrical Engineering Division of N.R.C. Scientists from DRTE and the Goddard Space Flight Center, NASA, may also participate.

The Great Whale Geophysical Station will continue its work of auroral photography and photometry, receiving satellite transmissions, and making a variety of radio frequency measurements for Canadian and U.S. agencies. Most of these measurements are correlated with measurements made at Byrd Station in Antarctica, which is at the geomagnetic conjugate point to Great Whale. There are plans to use facilities at Great Whale to supplement those at Churchill Research Range in connection with rocket and balloon borne experiments.

Division of Mechanical Engineering

Further studies of Churchill Harbour may be carried out with regard to extending the navigation season at this port.

National Aeronautical Establishment

Six aeromagnetic profiles will be flown over Baffin Bay at 50 Mile intervals from 71°30'N to 76° N out of Thule, Greenland. This will complete the reconnaissance of the Davis Strait and Baffin Bay. One or two of the more interesting areas found by this reconnaissance will be surveyed in detail (approx. 10 mile line spacing).

The N.A.E. will continue to be represented on the ACND Sub-Committee for Air Cushion Vehicles. Analysis of the photogrammetric surveys made during the 1966 air cushion vehicle trials in the Mackenzie Delta area is being considered to assess surface roughness.

DEPARTMENT OF NATIONAL REVENUE

DEPARTMENT OF NATIONAL REVENUE

CUSTOMS AND EXCISE

Responsibilities: To administer the Customs and Excise laws and regulations, particularly the Customs control of movement of aircraft and vessels.

Long-term Plans

To increase Customs service in pace with the development of the north.

Review of 1966 Operations

In the Yukon Territory, Whitehorse and Dawson were operated as Customs ports. Sub-offices under Whitehorse were Beaver Creek, Carcross and Pleasant Camp, B.C., and under Dawson was the sub-office of Old Crow.

The Customs office at Frobisher Bay, N.W.T., was transferred to the jurisdiction of the Port of Goose Bay, Nfld., with service provided by the R.C.M.P. The Inuvik office continued under the jurisdiction of the Port of Edmonton with part-time service provided by an employee of the Department of I.A. & N.D.

At sixteen other points officials of other government departments acted as Customs Officers for the purpose of clearing ships and aircraft. These were as follows:

Royal Canadian Mounted Police

Baker Lake	Pangnirtung
Cambridge Bay	Pond Inlet
Coppermine	Resolute Bay
Eskimo Point	Sachs Harbour
Lake Harbour	Spence Bay
	Tuktoyaktuk

Department of Transport

Alert	Isachsen
Coral Harbour	Mould Bay
Eureka	

Plans for 1967

Normal planning to meet responsibilities.

TAXATION DIVISION

Responsibilities: The administration and enforcement of the Income Tax Act (R.S.C., 1952, Chapter 148, as amended), the Dominion Succession Duty Act (R.S.C. 1952, Chapter 89, as amended), the Estate Tax Act (S.C. 1958, Chapter 29), Part I of the Canada Pension Plan Act (S.C., 1965, Chapter 51), and the collection of part of the taxes imposed by the Old Age Security Act (R.S.C., 1952, Chapter 200).

Long-term Plans

Long term plans are sufficiently flexible to cover administrative requirements as these are affected by changes in the population patterns in the northern areas and the extent that service is indicated in assisting individuals and companies in the interpretation of and in complying with the statutes administered by this Division.

Review of 1966 Operations

Normal operations as the program connected with the administration of the Income Tax & (Part I) Canada Pension Plan Acts as carried out in the Yukon Territory by the Whitehorse District Taxation Office and the Northwest Territories by the Edmonton District Taxation Office presented relatively few new problems.

Plans for 1967

The Whitehorse District Income Tax office will continue to service the Yukon Territory and the Edmonton District Office, the Northwest Territories. Some additional assistance to employers and self-employed people would appear to be indicated this year so that contributions in the required amounts will be made under the Canada Pension Plan.

NORTHERN CANADA POWER COMMISSION

NORTHERN CANADA POWER COMMISSION

Responsibilities: To provide Public Utilities in the Yukon and Northwest Territories as authorized by the Governor-in-Council. To operate each plant from consumer revenue on a self-sustaining basis including replayment of capital expenditures.

Long-term Plans

Forecast and normal planning in order to establish, maintain, and expand electrical and utility requirements.

Review of 1966 Operations

Northwest Territories

<u>PLANT</u>	<u>UTILITIES</u>	<u>CAPACITY</u>	<u>KWH OUTPUT</u>	<u>STAFF</u>	<u>CONSUMERS</u>	<u>APPROX. GROSS REVENUE</u>
Taltson (Hydro)	Power	25,000 HP	56,157,684	12	2 (wholesale)	\$ 594,125
Fort Smith Distribution System					655 (Retail)	\$ 212,322
Pine Point Distribution System					135 (Retail)	\$ 75,391
Inuvik (Diesel)	Power Heat Water & Sewerage	3,500 kw	10,768,700	39	582 55	\$ 409,793 \$ 463,203
					62	\$ 63,378
Fort McPherson (Diesel) (Operated for IAND)	Power	750 kw	860,445	12	56	\$ 23,638
Fort Simpson (Diesel)	Power	1,075 kw	2,419,820	27	194	\$ 156,697
Aklavik (Diesel) (Operated for IAND)	Power	470 kw	547,660	4	64	\$ 21,738
Frobisher Bay (Diesel & Gas Turbine)	Power Heat	4,000 kw	9,863,929	27	421 3	\$ 635,190 \$ 183,640
Fort Resolution (Diesel)	Power	325 kw	665,880	3	93	\$ 68,090

Northwest Territories (continued)

Snare River (Hydro) (Snare Rapids) (Snare Falls)	Power	17,550 HP	89,028,090	11	5 (wholesale)	\$ 582,691
Cambridge Bay (Diesel)	Power	600 kw	280,000*	5	29	\$ 21,999*

* Part year only - operated by NCPC since November 1st, 1966.

Yukon Territory

PLANT

Mayo (Hydro)	Power	6,000 HP	31,092,240	5	1 (wholesale) 161 (Retail)	\$ 386,766
Whitehorse (Hydro)	Power	15,000 HP	44,789,200	10	9 (Wholesale)	\$ 525,153
Dawson	Power Water	- -	2,231,244*	10	264 153	\$ 27,923* \$ 10,092*

* Part year only - operated by NCPC from October 1st, 1966 - power purchased from Yukon Consolidated Gold Corporation October 1st, 1966 to May 31, 1967.

The following work was completed:

- a) The Commission assumed responsibility for the supply of power and operation of the water pumping and distribution system in Dawson on October 1. A 750 kw diesel-electric station and a new power distribution system were constructed; the water system is to be renovated in 1967.
- b) The Commission assumed responsibility of the power plant and distribution system at Cambridge Bay, N.W.T. as of November 1.
- c) Investigation of power supply requirements for Coppermine, N.W.T.

Plans for 1967

The approximate capital expenditures will be \$2,500,000 and the following work is scheduled: -

- a) General maintenance of transmission lines and plants and extension of distribution systems as required to service new construction.
- b) Completion of the diesel generating plant at Dawson and reconstruction of the distribution system and water supply system.
- c) Increase capacity of the diesel-electric plants at Inuvik, Cambridge Bay, Fort Simpson, and Fort Resolution.
- d) Complete installation of equipment required for increasing the capacity of the domestic water service at Inuvik.
- e) Complete construction and equipping of the new diesel-electric plant at Fort McPherson.
- f) Investigation of power supply and requirements at Baker Lake.
- g) Establishment of a diesel generating plant at Coppermine and a gas turbine plant at Norman Wells.
- h) Construct a transmission line between Yellowknife and Rae.

**NORTHERN TRANSPORTATION
COMPANY LIMITED**

NORTHERN TRANSPORTATION COMPANY LIMITED

Responsibilities: To act as a common carrier of freight in the Western Arctic and on the Mackenzie River system, including Lake Athabasca, Great Slave Lake and Great Bear Lake, under the jurisdiction of the Board of Transport Commissioners.

To distribute freight by sea from Tuktoyaktuk to the DEW Line stations and to other populated areas in the Western Arctic.

Long-term Plans

Normal plans to meet responsibilities.

Review of 1966 Operations

Tonnage handled by the Company on the Mackenzie River system and in the Western Arctic for the 1966 season was 171,065 tons. This was a decrease of 10% from the 1965 figure. However, this tonnage reduction represented a reduction of 19% in revenue as much of the reduction was in long-haul traffic. No resupply moved into Alaska's Colville River this year and this, together with a decline in oil drilling activities along the Mackenzie, contributed in large measure to this reduction.

On the above total of 171,065 tons, 34,638 tons moved into Northern Alberta and Saskatchewan from Waterways; 8,642 tons moved into the Northwest Territories; and 11,541 tons moved southbound to Waterways. The balance of 116,244 tons represents movement within the Northwest Territories, Alberta, and Saskatchewan.

Operations in the Western Arctic were normal except for some adverse ice conditions encountered, for a part of the operating season, between Baillie Island and Cape Parry. All freight movements destined to the Arctic Area, including the resupply of the DEW Line, were completed.

Water conditions in the Mackenzie Watershed were good, for the most part, but again some difficulty was encountered in the Sans Sault Rapids area late in the season.

Plans for 1967 Operations

Capital Expenditures of \$965,000 are anticipated. Of this amount approximately \$430,000 will be carried over from last year's project in up-grading the freight facilities at Cache Point (Tuktoyaktuk); approximately \$500,000 will be spent further up-grading facilities at Hay River and accommodations at points on the Mackenzie. The balance represents replacement of obsolete agency mobile equipment.

POST OFFICE DEPARTMENT

POST OFFICE DEPARTMENT

Responsibilities: Provision of mail service to and from post offices in the Yukon and Northwest Territories.

Long-term Plans

To provide adequate mail service subject to the availability of transportation services.

Review of 1966 Operations

Transportation

The following table lists the scheduled air and surface mail transportation services on which mail was conveyed to and from the Yukon and Northwest Territories showing the expenditures for the fiscal year 1965-66.

YUKON

<u>Air Transportation</u>	<u>1965-66</u>
Dawson - Old Crow	\$ 35,036.10
Dawson - Stewart River	2,689.50
Vancouver - Whitehorse	710,447.97
Whitehorse - Dawson	39,798.29
Whitehorse - Ross River	<u>576.92</u>
Total	\$788,548.78

Surface Transportation

Atlin - Whitehorse	\$ 6,000.00
Dawson - Granville	1,820.00
Dawson Creek - Whitehorse	70,649.00
Keno Hill - Mayo	4,368.00

Whitehorse - Alaska Highway Mile 1202	8,954.00
Whitehorse - Dawson	15,163.00
Post Office to Airport Services	<u>6,603.00</u>

Total	\$113,557.00
Total expenditure for conveyance of mail to and from the Yukon Territory	<u>\$902,105.78</u>

NORTHWEST TERRITORIES

<u>Air Transportation</u>	<u>1965-66</u>
Edmonton - Mackenzie River Area	\$ 576,408.92
Fort Churchill - Baker Lake	77,988.14
Fort Churchill - Coral Harbour	14,242.32
Inuvik - Sachs Harbour	291.60
Montreal - Resolute	220,837.45
Yellowknife - Discovery	1,694.40
Yellowknife - Snowdrift	511.08
Fort Nelson - Fort Liard	1,367.60
Service to Cape Dorset	19,813.80
Christmas Air Drop (R.C.A.F.)	<u>12,773.08</u>

Total	\$925,928.39
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Surface Transportation

Hay River - Rae	\$ 1,500.00
Peace River - Hay River	44,103.75
Post Office to Airport Service	<u>22,094.00</u>

Total	\$ 67,697.75
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Total expenditure for conveyance of mail to and from the Northwest Territories	<u>\$993,626.14</u>
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As in previous years advantage was taken of the opportunity to despatch mail to settlements in the North on a courtesy basis, by government and privately owned vessels, flights of the R.C.A.F. and R.C.M.P., as well as aircraft chartered by other government departments.

Revenue

During the fiscal year 1965-66 the revenue derived from Post Offices was as follows:

Northwest Territories	\$150,183.24	
Yukon Territory	<u>167,991.55</u>	
Total		\$318,174.79

Expenditures for salaries at Post Offices paid from postal revenue were as follows:

Northwest Territories	\$ 83,879.02	
Yukon Territory	<u>63,752.65</u>	
Total		\$147,631.67

New Post Offices

Post Offices were established at Fort Franklin, and Spence Bay. These offices have been in operation since the 4th April and 21st September respectively.

It is the intention to establish Post Offices at Broughton Island and Igloolik, as soon as arrangements have been made for the transportation of mails.

Plans for 1967

To provide adequate postal service, commensurate with cost.

DEPARTMENT OF PUBLIC WORKS

DEPARTMENT OF PUBLIC WORKS

Responsibilities: Site investigations, planning and construction of buildings, highways, and bridges for both public use and to meet the requirements of other government departments. Maintenance and improvements to river routes and provision of wharves and harbour facilities as well as river bank protection. Planning and installation of sewer, water and power services in northern settlements. Provision of architectural and engineering services to all government agencies as required. Acquisition, management, and control of government properties. Construction and management of federal housing in northern settlements. Development planning of town-sites for larger settlements. Assistance in building research when required.

Long-term Plans

To act as architectural and engineering consultants and construction agents for the government on the effective development of northern Canada. To assist in the planning and construction of properly developed centres from which to administer and develop the North. These centres are Whitehorse, Inuvik, Yellowknife, Fort Smith, Hay River, Frobisher Bay and Churchill. To develop town plans for a number of settlements in order to co-ordinate properly the future expansion and development of these communities. To continue to provide engineering services to meet the requirements of government agencies in the field of site investigation and development planning and installation of sewer and water facilities, as well as highway maintenance and construction. To continue to maintain and improve navigable waterways and docking facilities. To establish housing standards for federal employees in northern communities. To acquire, manage and control government properties including Northern Pool Housing.

Review of 1966 Operations

The year saw commencement of a major reorganization within the Department of Public Works. The new organization will provide

decentralization of authority to Regional and District Offices. So that decisions can be made quickly and schedules can be arranged and contracts awarded to permit contractors to take advantage of the shipping facilities and complete the work within the deadlines dictated by arctic winters.

Building construction continued at a brisk pace with the award of major contracts for buildings at Coppermine, Inuvik, and Hay River. The new school was occupied at Fort McPherson and the gymnasium addition at Tuktoyaktuk was put into use. The Nursing Stations at Fort Franklin and Aklavik, the Federal Building at Hay River, the correctional institutions at Whitehorse and Yellowknife were occupied. R.C.M.P. detachments were completed at Aklavik, Cambridge Bay, Rae, Igloolik, Pangnirtung, Pond Inlet, and Spence Bay. School buildings were also occupied at Pangnirtung and Pond Inlet.

Leases were arranged for accommodation for the Department of Indian Affairs and Northern Development at Yellowknife and Fort Smith, and a lease was arranged for the various departments in Pine Point with expected occupancy in 1967.

Bulk Oil Storage facilities were provided at Baker Lake and Pond Inlet.

The 20-unit apartment building at Inuvik was completed.

General repairs was made to buildings at Fort Churchill and some redcoration was also done. A Seismograph Vault and Recorder Building for the Department of Energy, Mines and Resources was begun.

In Whitehorse a contract was carried out for alterations to the single employees' quarters.

The programme of upgrading and extending the trunk highway and developing the road system in the North continued.

Construction of the Hay River - Fort Smith Highway from the Pine Point Junction to Bell Rock, a distance of 120 miles was completed late in the fall. Bridges over the Salt River and the Little Buffalo River were completed on the Fort Smith - Hay River Highway. The construction of a second bridge over the Salt River, south of Fort Smith was finished in the late fall. A contract for widening and grade improvement on the Ingraham Trail from mile 14.7 to mile 19.8 was awarded and should be completed in August, 1967. A contract was also awarded for clearing grading on the Ingraham Trail from mile 20 to mile 50, work did not start until spring 1967.

Work began in August on a contract for the extension of the Mackenzie Highway from mile 117 to mile 167. This part of the highway from Fort Providence towards Fort Simpson should be completed in September 1967. Another contract was awarded for the reconstruction of a 2-mile section of Mackenzie Drive in the town of Hay River.

Work continued on the water intake and distribution and the sewage disposal systems for the town of Hay River. These should be in operation in the summer of 1967.

A dredging programme of channel maintenance and improvements was carried out on the Athabasca River. On the Mackenzie River maintenance dredging and harbour improvement was done. The channel was improved at mile 121, mile 635 (Sans Sault Rapids), Norman Wells, Arctic Red River, and Reindeer Depot, and maintenance dredging proceeded at Fort McPherson on the Peel River. The construction programme included completion of ship's haulout ways near to Fort Providence ferry crossing, the completion of wharf construction at Tuktoyaktuk and Inuvik, and installation of a floating wharf at Coppermine. The survey vessel M.V. "Hugh A. Young" carried out surveys and investigations for dredging, channel improvement, upkeep and repair of various structures.

In the Yukon Territory, reconnaissance surveys were made of possible routes from Carcross to Skagway, Alaska. Highway location and surveys and soils' investigations were carried out from mile 0 to mile 30 on the proposed road from Carmacks west to Onion Creek. Location Surveys were also done from mile 78 to mile 127 on the Dempster Highway north from Dawson.

Several mapping contracts were called for the Carmacks - Onion Creek route and for the extension of the Dempster Highway to Fort McPherson.

Grading contracts were called on the Ross River - Carmacks Road and on the Dawson Boundary Road; a contract was awarded and completed on the Watson Lake - Ross River Road where two bridges were under construction.

The maintenance of the Northwest Highway system continued. The contract between mile 83.6 and mile 263.4 continued and was extended

to mile 300. Eleven maintenance camps continued the routine maintenance work throughout the year. Five crusher crews and six surfacing crews resurfaced approximately 350 miles of highway. Ditching, clearing and culvert replacement was also done by eight summer maintenance crews.

Plans for 1967

A major school building at Hay River will be completed and opened early in the Summer of 1967, and work will continue on the school at Inuvik. One of the largest R.C.M.P. pre-fabricated Detachment Quarters is planned for their Hay River Detachment to be relocated in the new townsite. It is anticipated that a start will be made on another R.C.M.P. Building at Fort Smith.

Before the end of the 1967/68 fiscal year, it is expected new contracts will be awarded for construction at Inuvik, of fifty new houses, eight 4-bedroom houses, a sixteen-classroom school, a Navy Drill Hall, and an extension to the D.N.D. Administration Building. Childrens' Receiving Homes are to be built at Hay River and Inuvik, and also an addition to the mechanical workshop at the Inuvik Hospital. It is intended that a Seismograph Vault and Recorder Building will also be erected at Inuvik.

A contract approaching one million dollars will be awarded for various projects at Coppermine which will include a new school, Nursing Station and a powerhouse. Cambridge Bay will see the construction of a new school. In Fort McPherson a new Nursing Station will be erected.

Water supply and sewage disposal facilities will be provided at Baker Lake.

Dredging will continue, both maintenance dredging and channel clearance, in the Athabasca and the Sans Sault Rapids, and harbour improvements made at Hay River, Fort Resolution, and Fort McPherson.

Larger construction projects will include floating wharves at Great Bear, River Portage, and Fort Wrigley on the Mackenzie River; a new wharf at Fort Franklin; repairs and reconstruction of the wharf at Great Bear River at the upper terminus of the portage road, and wharf repairs at Fort Resolution.

A highway planning programme in which pre-engineering work is being made final includes a further extension of the highway towards Fort Simpson, site studies for bridges, and a survey for the Fort Simpson Airport Road. Other pre-engineering studies are being carried out for various roadworks.

Accommodation studies will continue and leasing arrangements will be made where this is possible.

Maintenance will continue on the Northwest Highway system. Grading work will be done on the Ross River - Carmacks Road, at a bridge built over the Lapie River. Bridge reconstruction on the Alaska Highway is contemplated at many locations the first year of a two-year programme. Further surveys and planning will be done to improve the highway system.

ROYAL CANADIAN MOUNTED POLICE

ROYAL CANADIAN MOUNTED POLICE

Responsibilities: The Royal Canadian Mounted Police is the only law enforcement agency in the Northwest Territories and the Yukon Territory, and is responsible for the enforcement of all laws, i.e., Federal Statutes, Territorial Ordinances, and the Criminal Code. In addition, the Force polices the municipalities of Whitehorse, Dawson, Hay River, and Yellowknife, enforcing municipal by-laws in those communities. The Force also performs a number of administrative duties on behalf of other Government departments and agencies who do not have representatives in the particular area.

Long-term Plans

The Force is gradually shifting to mechanized means of winter transportation, with more and more use being made of aircraft for long patrols. Motorized toboggans are replacing dog teams in selected areas. A program of replacing all remaining native-bred sleigh dogs with Siberian Huskies should be completed by 1969.

Review of 1966 Operations

Eleven new married quarters, and three new combined office-single quarters buildings were constructed. The Cambridge Bay Detachment was moved closer to the remainder of the settlement. The proposed construction of seven new married quarters in 1967 will complete our building program in the North, for married members, and will provide them with a satisfactory standard of housing. It is hoped to obtain at least two mobile Detachment house trailers for use in the Yukon at locations which have a heavy influx of population during the summer but which are dormant in the winter months.

The new territorial goals in Yellowknife and Whitehorse did not open as planned during 1966, but should be completed and ready for use during the spring of 1967.

The installation of single sideband radio equipment has now been completed at all Detachments in the Northwest Territories, and telex facilities have been installed in our Sub-Division Headquarters in Inuvik. No new Detachments were opened but consideration is being given to opening permanent Detachments at Ross River and Carcross in the Yukon Territory, in view of recent developments in the mining industry and continuing heavy summer influx of tourists.

<u>MILEAGE</u>	<u>1965</u>	<u>1966</u>
Dog Team.....	31,743	25,672
Boat.....	119,018	116,774
Foot Patrols.....	41,593	41,845
Aircraft, railway, motor-vehicle..	<u>1,718,606</u>	<u>1,790,838</u>
TOTAL	1,910,960	1,975,129

INVESTIGATIONS

Offences Investigated.....	9,081	9,531
Other duties.....	24,371	22,723 (Apr 1 - Dec
Total Prosecutions.....	6,115	6,008 31 only)
Prosecutions (Liquor).....	3,671	4,481
Murders Investigated.....	4	Nil
Narcotics Investigated.....	1	4

PRISONERS HANDLED

Yukon Sub-Division.....	1,887	2,398
Fort Smith Sub-Division.....	1,747	2,571
Western Arctic Sub-Division.....	783	949
Central Arctic Sub-Division.....	16	22
Eastern Arctic Sub-Division.....	<u>163</u>	<u>160</u>
TOTAL	4,596	6,100

In addition to regular duties as law enforcement officers, members in the more isolated areas continue to assist other Government departments and to engage in youth and sport activities.

The inoculation of dogs against rabies in the Yukon and Northwest Territories is the responsibility of the Force. A total of 10,445 dogs were vaccinated as compared to 8,900 in 1965.

The "Air" Division continues to operate Otter aircraft out of Air Detachments located at Whitehorse, Inuvik, Fort Smith, Fort Churchill, and Frobisher Bay.

"G" Division had a total strength of two hundred and five members of all categories (uniform, Special Constables, Civilian Members and Civil Servants) as of 31 DEC 1966. Twenty-two of these members were stationed in Division Headquarters, Ottawa, and three members were at Fort Churchill, Manitoba. The remaining one hundred and eighty members were located in the North.

Plans for 1967

The Hay River Detachment is to be moved to the new townsite early in the year and it will be renovated to provide increased guard room facilities.

DEPARTMENT OF TRANSPORT

DEPARTMENT OF TRANSPORT

Airports and Field Operations Branch

Responsibilities: The operation and maintenance of airports owned by the Department of Transport in the north.

Long-term Plans

To anticipate and satisfy future needs for Airports and Field Operations in the north in conjunction with northern development.

Review of 1966 Operations

Goose Bay, Labrador

Negotiations commenced with DND for the transfer of the operation and maintenance responsibility of the Goose Bay Airport to DOT.

Wabush, Labrador

Paving was completed on runway 01/19 to a length of 6000 feet and a width of 150 feet.

Fort Chimo, Quebec

Proposed reduced airport reserve boundaries were submitted to Quebec Government. No comment was received from provincial authorities. Renovations to the staff-house continued.

Schefferville, Quebec

Land boundaries are presently under review and should be approved in 1967.

Churchill, Manitoba

Uranium City, Saskatchewan

The surface treatment of the runway was not undertaken.

Plans for 1967 Operations

The transfer of airport operations to DOT will be completed, effective August 1.

Runway lighting will be completed.

The runway and apron will be paved, and the power lines relocated. Runway lighting will be reactivated.

The Airport boundary will be fenced and the rotating beacon relocated.

The remaining 8,500 feet of runway 15/33 will be repaved.

Fort McMurray, Alberta

The widening of the taxiway to 75 feet has been deferred. The access road from the new highway was completed. Air circulation equipment will be installed.

Grande Prairie, Alberta

Renovations to the Air Terminal Building and overlay of runway 06-24 were completed. The installation of runway and approach lighting continued.

Dawson Creek, B.C.

Runway lighting and paving of the runway, taxiway and apron were completed. The grass areas adjacent to last year's construction will be reseeded.

Fort Nelson, B.C.

Air Terminal extension to the operations building and storage building were deferred. Rehabilitation of the water lines, high intensity runway and approach lights, and a terminal extension to the operations building will be built.

Fort St. John, B.C.

The surface treatment of the runways and taxiways was completed in 1966. A sand storage building, firehall, and maintenance garage contract was awarded. The sand storage building and the new firehall will be constructed.

Baker Lake, N.W.T.

The land encompassing the airport and transmitter sites was established in the Department's name. Housing relocation to a better drained site was done during the summer and one storage building was erected. Additional fuel oil storage facilities are to be installed.

Cambridge Bay, N.W.T.

Lighting of the aircraft apron, taxiway, and terminal building car park was completed. A water supply and sewage disposal system is to be installed.

Coral Harbour, N.W.T.

Materials for a 3 bay garage, were purchased and shipped for construction during 1967.

Additional fuel oil storage capacity, and a new heating system for the existing equipment garage will be completed.

Fort Simpson, N.W.T.

The clearing of a runway flightway and the rehabilitation of the storage building were completed. The extension to the operations building was deferred.

The taxiways, apron and the access road will be gravelled.

Fort Smith, N.W.T.

The extension of air terminal building and related works were deferred.

Frobisher Bay, N.W.T.

DOT owned housing has been transferred to I.A.N.D. and a mutual interim agreement was reached regarding the airport reserve boundaries, further negotiations will be made prior to final agreement. I.A.N.D. assumed full responsibility for the maintenance of all roads, stores operations, single staff messing and building maintenance.

Hay River, N.W.T.

Paving of the runways, taxiways and the apron were commenced.

The paving and related work will be completed.

Norman Wells, N.W.T.

A storage building and two double dwellings were completed.

Replacement and extension of the gas lines, paving of the apron and taxiway, dwelling repairs, and improvement of the power facilities will be done.

Resolute, N.W.T.

The POL facilities were leased to Imperial Oil Ltd. Eight 13,000 gallon tanks were relocated from the South Camp to the tank farm. An additional diesel electric unit was overhauled and installed to meet power demands.

Fire alarm facilities will be installed.

Wrigley, N.W.T.

A powerline to the airport was completed. An operations building and waiting room was deferred.

Yellowknife, N.W.T.

The runways and taxistrips were repaired. The entrance road, car park, and maintenance garage roads were sealcoated. The runway flightway was cleared.

Teslin, Yukon Territory

Installation of modified runway lighting and flightway clearing were completed.

Watson Lake, Yukon Territory

Installation of modified runway lighting started.

A maintenance garage and firehall will be constructed.

Whitehorse, Yukon Territory

An emergency power house, a visual glide slope for runway 13 right, a new access road to the terminal area, and resurfacing of the main service road were done.

The relocation of operations to Hangar "A", and the erection of a storage building will be done.

CONSTRUCTION ENGINEERING AND ARCHITECTURAL BRANCH

Responsibilities: Construction for the Air Services of the
Department of Transport.

Long-term Plans

Normal planning to meet responsibilities.

Review of 1966 Operations

Airport development and lighting projects:

- (i) In the Northwest Territories:
Alert, Arctic Bay, Resolute Bay, Eureka, Cambridge Bay, Fort Smith, Hay River, Wrigley, Yellowknife.
- (ii) In the Yukon Territory:
Teslin, Watson Lake, Whitehorse.
- (iii) In the Provinces:
Churchill, The Pas, Thompson, Lynn Lake, Dawson Creek, Fort McMurray, Fort Vermillion, Peace River, Uranium City, Fort St. John.

Buildings and other miscellaneous projects:

- (i) In the Northwest Territories:
Coral Harbour, Baker Lake, Chesterfield Inlet, Resolute Bay, Alert, Coppermine, Fort Good Hope, Fort Resolution, Fort Simpson, Hay River, Norman Wells, Sachs Harbour, Fort Smith, Clyde River, Frobisher Bay.
- (ii) In the Yukon Territory:
Whitehorse, Burwash Landing, Mayo, Teslin, Watson Lake.
- (iii) In the Provinces:
Thompson, Trout Lake, La Ronge, Moosonee, Port Harrison, Fort McMurray, Fort Nelson, Fort St. John, Whitecourt, Grande Prairie, Fort Chimo, Buffalo Narrows, Cape Hopes Advance, Great Whale River.

Plans for 1967

Airport development and lighting:

- (i) In the Northwest Territories:
Fort Nelson, Hay River, Inuvik, Norman Wells, Fort Simpson, Chesterfield Inlet, Fort McPherson, Coppermine, Aklavik, Eskimo Point, Cape Dorset.
- (ii) In the Yukon Territory:
Watson Lake.
- (iii) In the Provinces:
Fort Chimo.

Buildings and other miscellaneous projects:

- (i) In the Northwest Territories:
Alert, Eureka, Mould Bay, Baker Lake, Coral Harbour, Resolute Bay, Cambridge Bay, Fort McMurray, Fort Nelson, Fort Simpson, Hay River, Inuvik, Norman Wells, Gjoa Haven, Pelly Bay, Coppermine, Fort Smith, Wrigley, Frobisher.
- (ii) In the Yukon Territory:
Watson Lake, Whitehorse, Burwash Landing.
- (iii) In the Provinces:
Fort Chimo, Churchill, Thompson, Fort St. John, Deception Bay, Fort Chipewyan, Fort Nelson, Port Harrison, Nitchequon, Dawson Creek.

METEOROLOGICAL BRANCH

Responsibilities: Provision of adequate meteorological facilities and services to meet requirements; research necessary to support these services and to increase understanding of the weather and climate of northern Canada, both near the surface and in the upper air observing stations; obtaining of meteorological reports from ships in northern waters; ice reconnaissance; the provision of weather forecasting and weather advisory service; ice forecasting and ice advisory service for the navigable waters of the north. Operation of thirteen upper air stations in the north and, jointly with the United States Weather Bureau, operation of the Joint Arctic Weather Stations in the Queen Elizabeth Islands at Resolute, Alert, Eureka, Isachsen, and Mould Bay, including maintenance and development of the supporting airstrips at the last four of these stations, and operation of telecommunications facilities at these four stations in support of the meteorological program.

Long-term Plans

To provide more complete meteorological and related scientific information in the north, necessitating an expanded network of surface weather observing stations and improved equipment for upper air observations to higher levels; to provide forecasting services as needed for expanding activities in the north; to provide more married living accommodations at several locations in order to encourage more experienced personnel to serve at these stations; to operate seismic vaults for the Department of Energy, Mines & Resources at a few locations, and to undertake a program of ozone, water vapour, and radiation observations to high levels in the atmosphere at certain stations.

Review of 1966 Operations

The synoptic and aviation weather reporting network, north of 60°N, which includes the Joint Arctic Weather and DEW Line Stations was reduced from 55 to 54 stations. Two Aeradio stations, Aishihik, Y.T. and Snag, Y.T. were closed and dismantled. This was offset by the opening of one new aeradio station, Burwash, Y.T. The meteorological programme at the DEW Line sites remained unchanged. The radioactive fall-out sampling programme continued at 6 meteorological stations.

The visual auroral programme was reduced from 22 to 15 stations. The noctilucent cloud observing network remained unchanged at 17 stations and the number of stations completing snow surveys was increased by six to a total of 23. The following miscellaneous networks were also maintained; autographic rain record- 3 stations, sunshine - 11, soil temperature - 3, evaporation - 5, and ozone - 1 station. Approximately 80% of the surface observing network was visited by meteorological inspectors and each DEW Line site was inspected at least twice. All the upper air stations maintained their full programme of two rawinsonde ascents per day sending instruments to heights averaging over 80,000 ft. to measure and transmit temperature, pressure, and relative humidity data throughout the ascents. These instruments were also tracked to determine the upper winds at the various levels. Significant progress was made in the effort to achieve higher levels in upper air and upper wind observations.

New rawinsonde ground equipment was installed at Sachs Harbour and Clyde River in August and October respectively. This new electronic balloon tracking equipment requires a horizon which is free from obstruction down to at least 4° elevation. Several of the stations still do not meet these requirements. Additional surveys have been undertaken to relocate the upper air stations at Clyde, Frobisher, Inuvik, and Coppermine in order to provide a better horizon for the GMD rawinsonde ground equipment. In addition to regular upper air observations, the personnel at Coppermine and Frobisher are carrying out a program of seismological observations for the Department of Energy Mines and Resources.

The Arctic Forecast Team, a component of the Weather Office in Edmonton, continued to provide routine and special forecasts for

various activities in the Arctic. Specialized services were also provided for the Yukon, Baffin Island, and the southern part of the Northwest Territories by Weather Offices at Whitehorse, Goose Bay, Frobisher, and Winnipeg.

The High Level Forecast Centre in Montreal routinely issued forecasts for high altitude aviation for areas extending from the Canada-U.S. border to the North Pole and distribution of these forecasts was made throughout Canada and internationally by facsimile.

The Ice Forecast Central in Halifax issued seasonal ice outlooks, thirty day ice forecasts, and five day ice forwards for Arctic and sub-Arctic waters. A Field Ice Forecast Office was operated at Frobisher from mid-July to early October to provide short-range ice forecasts and ice advisories for the Hudson Bay shipping route, Foxe Basin and the Eastern Arctic. A Field Ice Forecast Office operated at Cambridge Bay from mid-July to early August and at Resolute from early August to early September to provide short-range ice forecasts and advisories for coastal waters of the Western and Central Arctic.

The ice observing program was carried out by twenty trained ice observers on aerial and shipboard assignments in the Arctic. Supplemental shore station and ice thickness reports were provided by selected stations on a cooperative basis by a number of agencies.

Due to an increased all weather and endurance capability by the long term chartering of two specially equipped Douglas DC-4 aircraft during the latter part of 1966, it was possible to obtain the required three phases of coverage (Break-up, support to marine navigation, and freeze-up).

Three series of pre-season flights were completed over Arctic shipping routes in April, May, and June to obtain ice reconnaissance data for the seasonal outlook of ice conditions. Each DC-4 coverage originated from Frobisher Bay and the entire pre-season program totalled 114 flying hours of ice reconnaissance.

Due to the pending integration of the two specially equipped DC-4 aircraft, the program of ice reconnaissance was adjusted slightly

over previous years for the Arctic navigation season. An unmodified DC-4 in long range configuration was used for major coverage requirements during the season with three DC-3 supplemental aircraft for briefer periods performing tactical needs. During the period July 4 to October 18, these four aircraft completed 129 missions totalling 1,081 flying hours.

Three Arctic freeze-up probes of a "Round Robin" nature were carried out during the period October 4 - December 21 using the two specially equipped DC-4's during which 221 flying hours of ice reconnaissance data was obtained.

An ice survey was completed over the southern Mackenzie River system during the period April 21 - June 21 where 15 flights totalling 54 hours of ice reconnaissance were completed.

Shipboard ice observers were assigned to seven departmental ice-breakers in the Arctic for 651 days of duty and during this period 97 short range helicopter flights totalling 56 flying hours were made.

Thirty-seven selected stations provided shore station ice reports during the navigation season, and twenty-seven sites provided weekly ice thickness reports during the remainder of the year.

Fifty-three stations in the Northwest Territories and Yukon participated in the continuing program to obtain the dates of break-up and freeze-up of rivers, lakes, and salt water bodies.

At the Joint Arctic Weather Stations the meteorological program consisted of eight regular surface synoptic observations and two upper air (rawinsonde) observations daily. Continuous readings of solar radiation and weekly measurements of sea ice thickness were collected from all stations. Additional programs were carried out as follows:

Aurora: Resolute, Alert, Isachsen, Mould Bay
Snow Survey: Resolute, Eureka
Wind Chill: Isachsen, Alert
Sea ice temperature profile: Mould Bay
Hourly surface weather, soil temperature, noctilucent clouds, ozone, radio-active fallout, rate of evaporation: Resolute

At Alert, the meteorological technicians operated the neutron monitor for Atomic Energy of Canada. At Resolute precipitation samples were collected and shipped in a frozen state to McGill University for analysis.

An electrolytic hydrogen generator was installed at Alert in September. Electrolytic generators are now operating successfully at all five stations.

The airstrips at Alert, Eureka, Isachsen, and Mould Bay remained in excellent condition throughout the entire summer. A routine maintenance program was carried out on all airstrips. At Isachsen, about 17,000 cubic yards of fill were placed in the gully at the northeast end of the runway in a continuing program to lengthen it to 5,000' or better.

Plans for 1967

It is planned to proceed with the preliminary work of resiting the upper air station at Clyde River to a more suitable location and to undertake a more thorough survey of the possibilities of locating an upper air station at Cambridge Bay to replace the present station at Coppermine. The new electrolytic hydrogen generators will be issued to the upper air stations to replace the present chemical generators as soon as CSA approval has been obtained. This will very likely be in time to ship the generators to the various stations by the summer sea supply.

It is expected that extension of the Isachsen airstrip to the dimensions 175 ft. x 5,000 ft. will be completed.

Changeover of airlift of bulk fuel oil from Resolute to Mould Bay and Isachsen from RCAF to commercial air carrier will be implemented in April.

The Meteorological Branch snow survey program will be extended to Mould Bay, Isachsen, and Alert as soon as equipment becomes available.

A second D336 generator will be installed at Alert to ensure the availability of 150 kilowatts of power on a continuing basis. Three-phase power distribution systems will be completed for Mould Bay and Alert.

Control tower type anemometers will be installed adjacent to the runways at Eureka, Isachsen, and Mould Bay.

In consonance with changes being introduced throughout Canada, the

Arctic Forecast Team, a component of the Weather Office at Edmonton, is being re-organized into a separate Arctic Weather Central at Edmonton. This office, drawing support from the Central Analysis Office at Montreal will continue to provide routine and special forecasts for various activities in the Arctic, and will eventually provide forecast guidance to offices at Whitehorse and Frobisher, which in turn provides services for the Yukon and Baffin Island.

With the integration into the ice reconnaissance program of the two DC-4 aircraft including improved observer aids and precise navigation equipment, it will be possible to increase the effectiveness of each flight by meeting requirements in a more efficient and accurate manner. Studies are continuing on improvements to the airborne radar to provide ice observations below a cloud cover and on the development of a remote method for the airborne measurement of ice thickness.

TELECOMMUNICATIONS AND ELECTRONICS BRANCH

Responsibilities: To provide radio aids to air and marine navigation; to provide radio facilities for various scientific organizations and for meteorological observations; to provide other telecommunications facilities as required; to foster and promote the development of public telecommunications services; to control and manage the use of the frequency spectrum; to license stations and enforce the regulations under the Radio Act.

Long-term Plans

To expand on operations as the need arises.

Review of 1966 Operations

Baker Lake

Rehabilitation and improvement to buildings, building area relocation, and water & sewage services were completed.

Burwash Landing

A new aeradio station was commissioned.

Chesterfield Inlet

A single sideband circuit to Churchill was completed and circuitry to HBC outstations was improved with the commissioning of single sideband radiotelephony equipment.

Ennadai Lake

A low frequency teletype to Churchill was commissioned.

Fort Good Hope

Two new dwellings and new sewage system were completed, and a new non-directional beacon was placed on continuous operation.

Frobisher

The radio facsimile ice information coverage was expanded.

Mayo

A transmitter building and a 2 bay garage were completed.

Norman Wells

A new receiver building was completed.

Resolute

VHF Air-Ground communications frequencies were commissioned to improve domestic air-carrier Service.

Sachs Harbour

A new remote transmitter site was established.

Development of Public Telecommunications Services

Canadian National Telecommunications completed construction of the Mackenzie Valley system to its northern terminus at Inuvik and the system was formally opened on August 2. The system was extended by VHF radio to Tuktoyatuk where long distance telephone service was made available on December 22nd. Reindeer Depot was connected to Inuvik during the year. A traffic interchange point between Dewline and CNT Commercial facilities was established at Lady Franklin Point December 27.

Canadian National Telecommunications opened single sideband base stations at Cambridge Bay and Inuvik as well as outstations at Spence Bay, Gjoa Haven, Bathurst Inlet, Pelly Bay, Thom Bay, Holman Island, Sachs Harbour, Snowdrift, Rocher River, Nahanni Butte, Fort Liard, Perry River, Pellett Lake, Reindeer Depot, and Old Crow.

A telephone system and automatic exchange was installed at Ross River and switchboards were installed at Fort Good Hope, Providence, Norman Wells and Coppermine.

A VHF public radio station was placed in service at Fort Simpson and a similar station for mobile service was placed in operation at Canyon Mountain.

Bell Telephone installed small exchanges at Coral Harbour Airport and Asbestos Hill.

General

The aeradio stations at Aishihik and Snag were closed coincident with the commissioning of the station at Burwash Landing.

As a service to CCG ships operating on the Eastern Arctic sealift broadcasts of weather and notice to shipping information are made simultaneously by Frobisher on three MF/HF frequencies.

New periodic type marine radiobeacons were commissioned at Middle Island and Spotted Island.

The air operations teleprinter network was extended to Fort Simpson, Wrigley, Norman Wells, Fort Good Hope and Inuvik.

Plans for 1967

Coral Harbour

Full time ship-shore communications are planned with the beginning of the navigation season.

Coppermine

A new remote transmitter site is planned.

Fort Smith

Site selection for an instrument landing system is planned.

Frobisher and Inoucdjouac

Installation of new facsimile receiving terminal is planned and single sideband equipment will be installed at Frobisher Bay and Inoucdjouac (Port Harrison) to improve communications with a number of Hudson Bay Company stations.

Hay River

Site selection for an instrument landing system will be carried out.

Inuvik

A non-directional aeronautical beacon will be established and the installation of an instrument landing system will be started.

Norman Wells

A new transmitter building is to be constructed.

Yellowknife

A new transmitter building is to be constructed.

Public Telecommunications Plans for 1967

Canadian National Telecommunications projects planned for completion include radio links from Lady Franklin Point to Coppermine, Norman Wells to Fort Franklin and a VHF public radio station at Norman Wells.

CNT plan to augment the long distance toll circuits between Yellowknife and Hay River and to expand local telephone systems at Yellowknife and Inuvik. They also expect to establish one-way direct distance dialing into Yellowknife, Hay River, Fort Smith, and Pine Point.

Plans for servicing the RCMP Police, the Yukon Territorial Government and Federal Departments are under review by CNT in collaboration with these agencies.

The Bell Telephone Company plans for the Northeast Arctic include service arrangements for Baffin Island Iron Mines, Asbestos Hill, and Churchill Falls projects. The Company is also studying ways of completing requests for service desired by Nursing stations at Hall Beach, Broughton Island, Clyde River, Grise Fiord, Lake Harbour, Padloping Island, and Port Burwell.

MARINE

Responsibilities: To fulfill transportation requirements and facilities in the Arctic including co-ordination of cargo and passenger requirements for Government departments and commercial enterprise; to provide aids to navigation in the Hudson Bay and Strait and Goose Bay; to conduct ice probes in the Milne Inlet area; to render icebreaking assistance whenever and wherever required; to assist in hydrographic and oceanographic surveys; to arrange and provide for stevedoring services at the Port of Goose Bay.

Long-term Plans

To continue to improve marine work in the North, and planning to meet any anticipated resupply requirements in the future.

Review of 1966 Operations

Again this year, cargo for the Canadian Armed Forces was transported to Thule, Greenland, for transshipment by air to Alert. The resupply of Resolute Bay was carried out successfully by one dry cargo vessel, and one tanker supported by icebreakers. The station at Eureka and a site in Tanquary Fiord were visited by the CCGS "John A. Macdonald" and supplies and bulk oil landed. During the early part of the season, an ice probe was carried out by the CCGS "d'Iberville" in the Milne Inlet and Eclipse Sound areas. This work at the close of the season was carried out by the CCGS "John A. Macdonald".

In the Hudson Bay and Strait area, direction finding stations were calibrated and navigation lights lit and put into operation.

The CCGS "Labrador" assisted in surveys of Ungava Bay, Baffin Bay, Davis Strait, and the Labrador Sea.

Commercial shipping requiring icebreaker assistance to and from Churchill was provided by icebreakers. All navigational aids were examined and serviced as required.

In order to provide transportation for supplies being shipped to the Eastern Arctic, the department arranged for and provided fourteen Coast Guard vessels, six chartered vessels, and nine commercial vessels.

The CCGS "Camsell" assisted shipping in the Western Arctic and escorted vessels in the area as required. Aids to navigation were also serviced and hydrographic survey assistance provided. For the first time, the "Camsell" successfully penetrated as far North as Bellot Strait and also circumnavigated King William Island.

Slightly over one hundred thousand (100,000) short tons of dry cargo and bulk oil were transported and handled in the North in 1966 and a breakdown of tonnage by vessels follows this report. There was a slight reduction in tonnage moved to the Western Arctic and also in cargo shipments to Goose Bay. In some areas in the Eastern Arctic, increases are noted.

Plans for 1967

Plans are anticipated to be of the same pattern as in 1966 including scientific and survey work as required by Government departments, icebreaking and assisting commercial vessels as required, and stevedoring operations at Goose Bay.

STATEMENT OF TONNAGES SHIPPED
TO THE EASTERN ARCTIC DURING
1966

<u>VESSEL</u>	<u>VOYAGE</u>	<u>WEIGHT (LBS.)</u>	
CCGS "Auk" (Canadian Coast Guard Ship)	Montreal - Arctic Sites	207,710	
	Churchill - Igloolik	199,286	
	Hall Beach - Igloolik	6,000	
	Tanker - Pond Inlet	734,200	
	Tanker - Pangnirtung	911,400	
	Tanker - Igloolik	351,200	
	Tanker - Cape Christian	686,000	
	Tanker - Broughton Island	369,400	
	Tanker - Rowley Island	1,205,400	
	Tanker - Longstaff Bluff	1,411,200	
	Tanker - Cape Dorset	1,010,800	
	Tanker - Coral Harbour	1,905,000	
	Tanker - Rankin Inlet	<u>3,941,400</u>	
			12,938,996
CCGS "Eider"	Montreal - Labrador Sites	129,919	
	Churchill - Eskimo Point	71,120	
	Povungnituk - Churchill	822	
	Churchill - Kaskattama River	139,225	
	Kaskattama River - Churchill	94,700	
	Great Whale River - Churchill	20,000	
	Churchill - Various	962,535	
	Tanker - Great Whale River	6,878,000	
	Goose Bay - Port au Port	886,660	
	Goose Bay - Saglek	1,838,880	
	Goose Bay - Resolution Island	<u>43,000</u>	
			11,064,861
CCGS "Gannet"	Montreal - Baffin Sites	521,200	
	Brevoort - Cape Dyer	4,000	
	Cape Dyer - Cape Dorset	15,015	
	Cape Dyer - Igloolik	3,000	
	Hall Beach - Longstaff Bluff	3,820	
	Longstaff Bluff - Hall Beach	<u>204,040</u>	
			751,075

CCGS

"Puffin"

Montreal - Great Whale River	264,000
Great Whale River - Churchill	3,025
Churchill - Chesterfield Inlet	4,000
Churchill - Baker Lake	1,148,911
Churchill - Eskimo Point	1,097,287
Eskimo Point - Churchill	1,900
Churchill - Chesterfield Inlet	1,095,715
Chesterfield Inlet - Churchill	2,965
Churchill - Fort George	703,435
Churchill - Whale Cove	1,128,121
Churchill - Fort Chimo	45,000
Montreal - Quebec	126,000
Montreal - Hopedale	198,028
Montreal - Battle Harbour	526,700
Montreal - Forteau, Labrador	50,500
Montreal - Cartwright	168,000
Goose Bay - Cartwright	14,635
Goose Bay - Port au Port	740,000
Quebec - Great Whale River	16,000
Payne Bay - Quebec	22,262
Goose Bay	2,600
Hopedale - Quebec	20,000
Blanc Sablon - Quebec	8,000
Blanc Sablon - Quebec	54,000

7,441,084

CCGS

"Raven"

Montreal - Great Whale River and Povungnituk	514,000
Churchill - Baker Lake	1,099,276
Baker Lake - Churchill	3,250
Churchill - Kaskattama River	38,151
Churchill - Fort George	826,574
Kaskattama River - Churchill	19,661
Churchill - Igloolik	979,964
Churchill - Baker Lake	1,278,538
Churchill - Rankin Inlet	35,546
Baker Lake - Churchill	1,000
Rankin Inlet - Churchill	8,555
Churchill - Rankin Inlet	231,298
Churchill - Deception Bay	6,048
Churchill - Sugluk	3,887

CCGS			
"Raven"	Churchill - Povungnituk	32,785	
	Churchill - Rankin Inlet	9,293	
	Churchill - Sugluk	442,000	
	Churchill - Rankin Inlet	42,300	
	Rankin Inlet - Churchill	<u>41,600</u>	5,613,726
CCGS "Skua"	Montreal - Forteau Bay	59,700	
	Montreal - Quebec	<u>54,000</u>	113,700
Sub Total N.S.V.'s:			37,923,442
CCGS			
"Camsell"	Victoria - Cambridge Bay	12,500	12,500
CCGS			
"C. D. Howe"	Montreal - Arctic Sites	917,800	
	Grise Fiord - Frobisher Bay	1,000	
	Resolute Bay - Grise Fiord	235	
	Broughton Island - Pangnirtung	1,000	
	Pond Inlet - Pangnirtung	30	
	Grise Fiord - Pangnirtung	40,000	
	Pond Inlet - Grise Fiord	1,245	
	Resolute Bay - Clyde River	250	
	Pond Inlet - Resolute Bay	175	
	Deception Bay - Clyde River	350	
	Pond Inlet - Arctic Bay	5,000	
	Wakeham Bay - Koartak	300	
	Sugluk - Wakeham Bay	150	
	Cape Dorset - Montreal	13,200	
	Ivugivik - Quebec	225	
	Wakeham Bay - Quebec	100	
	Port Burwell - Quebec	5,000	
	Arctic Bay - Quebec	33,000	
	Grise Fiord - Quebec	33,715	
	Pangnirtung - Quebec	<u>3,000</u>	1,055,775
CCGS			
"d'Iberville"	Montreal - Arctic Sites	962,780	
	Wayports and Retrograde	<u>162,942</u>	1,125,722

CCGS "John

A. Macdonald	Montreal - Sugluk	42,032
	Montreal - Grise Fiord	22,078
	Montreal - Wakeham Bay	1,000
	Montreal - Eureka	706,096
	Montreal - Thule	6,738
	Montreal - Resolute Bay	46,447
	Montreal - Payne Bay	1,124
	Montreal - Mould Bay	58
	Montreal - Cape Dorset	19,850
	Montreal - George River	780
	Montreal - Pond Inlet	425
	Montreal - Koartak	43,665
	Montreal - Tanquary Fiord	62,558
	Quebec - Resolute Bay	100,000
	Tanquary Fiord - Dartmouth	500
	Eureka - Dartmouth	200
	Thule - Resolute Bay	82,450
	Eureka - Resolute Bay	2,308
	Resolute Bay - Eureka	65,617
	Tanquary Fiord - Eureka	20,000
	Pond Inlet - Grise Fiord	270,440
	Resolute Bay - Grise Fiord	970
	Grise Fiord - Pond Inlet	7,020
	Thule - Eureka	39,150

1,541,506

CCGS

"Labrador"	Dartmouth - Frobisher Bay	250
	Frobisher Bay - Various	17,430

17,680

CCGS

"Moncalm"	Montreal - Ivugivik	367,815
	Montreal - Koartak	37,405
	Montreal - Sugluk	187,712
	Montreal - Pangnirtung	777
	Montreal - Ships Stores	12,305
	Churchill - Cape Dorset	186,518
	Churchill - Payne Bay	22,841
	Churchill - Eskimo Point	52,521
	Churchill - Povungnituk	34,885
	Churchill - Wakeham Bay	1,050

CCGS

"Montcalm"	Churchill - Port Harrison	15,600	
	Churchill - Port Burwell	500	
	Churchill - Cape Hopes Advance	480	
	Churchill - Ivugivik	500	
	Churchill - Koartak	510	
	Ivugivik - Sugluk	425	
	Hall Beach - Ivugivik	3,000	
	Frobisher Bay - Cape Dorset	15,845	
	Port Harrison - Quebec	11,410	
	Cape Dorset - Quebec	2,005	
	Nottingham Island - Quebec	500	
	Wakeham Bay - Quebec	800	
	Povungnituk - Quebec	1,300	
	Ivugivik - Quebec	28,420	
	Koartak - Quebec	12,460	
	Sugluk - Quebec	24,680	
	Cape Hopes Advance - Quebec	<u>19,250</u>	
			1,041,514

CCGS

"Narwhal"	Dartmouth - Cape Christian	1,600	
	Dartmouth - Igloolik	1,230	
	Dartmouth - Broughton Island	907	
	Dartmouth - Clyde River	6,672	
	Frobisher Bay - Pangnirtung	728	
	Cape Dyer - Brevoort	3,980	
	Hall Beach - Pangnirtung	<u>15,040</u>	
			30,157

CCGS "N. B.
McLean"

Montreal - Various	500,000
Various - Churchill	61,686
Churchill - Various	314,933
Pond Inlet - Frobisher Bay	2,200
Frobisher Bay - Quebec	1,281
Churchill - Various	474,481
Chesterfield Inlet - Quebec	5,870
Resolute Bay - Quebec	76
Cape Dorset - Quebec	1,500
Port Burwell - Quebec	4,060
Nottingham Island - Quebec	1,146

CCGS "N. B. McLean"		Whale Cove - Quebec	15,861	
		Quebec - George River	1,537	
		Quebec - Port Burwell	112	
		Arctic Bay - Frobisher Bay	2,200	
		Coral Harbour - Grise Fiord	6,000	
		Resolute Bay - Sugluk	64,032	
		Resolute Bay - Wakeham Bay	1,000	
		Resolute Bay - Fort Chimo	16,870	
		Resolute Bay - Payne Bay	1,621	
		Resolute Bay - Cape Dorset	19,850	
		Resolute Bay - George River	780	
		Resolute Bay - Koartak	<u>43,705</u>	
				1,540,801
CCGS "Wolfe"		Halifax - Arctic Ports	674,000	
		Frobisher Bay - Pangnirtung	15,040	
		Halifax - Nattelling Lake	26,580	
		Churchill - Pelly Bay	40,240	
		Churchill - Hall Beach	1,770	
		Churchill - Igloolik	23,231	
		Churchill - Pangnirtung via		
		Hall Beach	15,056	
		Churchill - Repulse Bay	72,790	
		Nottingham Island - Churchill	3,150	
		Churchill - Cape Dorset	<u>124,062</u>	
				995,919
Sub Total Icebreakers				7,361,574
M. V.	Montreal - Fort Chimo	316,143		
"Cacouna"	Fort Chimo - Montreal	<u>20,000</u>		
(Motor Vessel)				336,143
M. V. "C. A. Crosbie"	Montreal - Povungnituk	9,290		
	Montreal - Port Harrison	1,428,383		
	Montreal - Great Whale River	109,535		
	Churchill - Frobisher Bay	344,380		
	Port Harrison - Montreal	32,000		
	Povungnituk - Montreal	150		
	Great Whale River - Montreal	2,800		
	Port Harrison - Montreal	<u>112,570</u>		
				2,039,108

M. V. "Caribou Reefer"	Montreal - Frobisher Bay	97,695	97,695
M. V. "Domino Run"	Montreal - Fort Chimo	599,758	
	Fort Chimo - Montreal	<u>125,405</u>	725,163
M. V. "Ghis- lain Marie"	Montreal - Baker Lake	1,175,590	
	Baker Lake - Montreal	<u>126,130</u>	1,301,720
M. V. "Irish Willow"	Montreal - Chesterfield Inlet	26,546	
	Montreal - Whale Cove	366,367	
	Montreal - Rankin Inlet	470,136	
	Montreal - Eskimo Point	1,007,339	
	Rankin Inlet - Eskimo Point	11,900	
	Rankin Inlet - Montreal	2,969	
	Eskimo Point - Montreal	<u>59,420</u>	1,944,677
M. V. "P. M. Crosbie"	Montreal - Wakeham Bay	357,210	
	Montreal - Koartak	10	
	Montreal - Ivugivik	1,740	
	Montreal - Sugluk	2,808	
	Montreal - Port Burwell	1,136,180	
	Montreal - George River	833,750	
	Montreal - Payne Bay	790,840	
	Wakeham Bay - Montreal	29,920	
	George River - Montreal	27,700	
	Payne Bay - Montreal	72,080	
	Port Burwell - Montreal	<u>50,560</u>	3,302,798
M. V. "Sillery"	Montreal - Coral Harbour	1,029,385	
	Montreal - Chesterfield Inlet	234	
	Montreal - Baker Lake	115	
	Montreal - Whale Cove	2,644	
	Coral Harbour - Montreal	<u>194,035</u>	1,226,413

S.S. "Wold- ingham Hill" (Steam Ship)	Montreal - Chesterfield Inlet	263,000	
	Churchill - Frobisher Bay	87,925	
	Frobisher Bay - Montreal	<u>64,083</u>	415,008

M.V. Church- ill River"	Various Ports	69,510	
M.V. "Fort Severn"	Various Ports	300,272	
M.V. "Pierre Radisson"	Various Ports	148,291	
M.V. "Rupert River"	Various Ports	<u>212,044</u>	730,117

Total (Commercial Vessels) 12,118,842

S.S. "Caba- hawk"	Montreal - Resolute Bay	3,214,493	
	Quebec - Resolute Bay	118,629	
	Montreal - Pond Inlet	1,081,977	
	Montreal - Arctic Bay	1,563,568	
	Montreal - Isachsen	81,351	
	Montreal - Alert	39,675	
	Montreal - Mould Bay	240,349	
	Montreal - Grise Fiord	270,000	
	Resolute Bay - Montreal	218,134	
	Resolute Bay - Quebec	1,300	
	Pond Inlet - Montreal	32,550	
	Arctic Bay - Montreal	<u>6,960</u>	6,868,986

S.S. "Den- mark Hill"	Montreal - Frobisher Bay	3,497,640	
	Frobisher Bay - Pangnirtung	11,640	
	Montreal - Pangnirtung	1,487,040	
	Pangnirtung - Montreal	172,998	
	Frobisher Bay - Montreal	<u>384,639</u>	5,553,957

S.S. "Federal Pioneer"	Montreal - Dew Line Sites	6,988,320	
	Cape Hooper - Cape Dyer	6,000	
	Cape Dyer - Broughton Island	7,980	

S.S. "Federal			
Pioneer"	Broughton Island - Hall Beach	1,000	
	Hall Beach - Igloolik	3,360	
	Cape Dyer - Montreal	18,280	
	Dew Line Sites - Montreal	<u>1,277,000</u>	8,301,940
M.V. "J.			
Edouard	Montreal - Resolute Bay	14,620,480	14,620,480
Simard"			
M.V. "Jos			
Simard"	Churchill - Rankin Inlet	4,675,000	
	Churchill - Cape Dorset	1,275,000	
	Churchill - Coral Harbour	1,530,000	
	Churchill - Coral Harbour	722,500	
	Montreal - Pond Inlet	864,000	
	Montreal - Pangnirtung	1,320,000	
	Goose Bay - Baffin	11,808,000	
	Goose Bay - Foxe Basin	<u>13,106,000</u>	35,300,500
M.V. "Sir			
John Crosbie"	Montreal - Thule	1,206,289	
	Montreal - Pond Inlet	365,696	
	Goose Bay - Hopedale	644,620	
	Goose Bay - Saglek	672,040	
	Goose Bay - Resolution Island	243,140	
	Goose Bay - Cartwright	604,800	
	Goose Bay - St. Anthony	204,600	
	Hopedale - Goose Bay	89,040	
	Saglek - Montreal	268,720	
	Resolution Island - Goose Bay	10,560	
	Cartwright - Goose Bay	85,780	
	Hopedale - Saglek	300	
	George River - Montreal	<u>15,028</u>	4,410,613
M.V. "Transin-			
land"	Goose Bay - Resolution Island	5,063,560	
	Goose Bay - Saglek	380,000	
	Saglek - Goose Bay	3,603,280	
	Goose Bay - Saglek	2,911,380	
	Goose Bay - Hopedale	<u>2,526,580</u>	14,484,800
Total Chartered Ships			89,541,276

N. T. Co.	Waterways - Various	125,000	
Barge	Fort Smith - Various	17,200	
(Western	Hay River - Various	738,000	
Arctic)	Norman Wells - Various	3,853,800	
	Tuktoyatuk - Various	<u>599,200</u>	
			5,333,200
Goose Bay	Discharging Cargo	41,861,180	
	Loading Cargo	<u>7,210,880</u>	
			49,072,060

R E C A P I T U L A T I O N

Cargo Carried via N.S.V.'s (6)	37,923,442	
Cargo Carried via Icebreakers (10)	7,361,574	
Cargo Carried Tonnage Basis (13)	12,118,842	
Cargo Carried Chartered Vessels (7)	89,541,276	
Western Arctic Operation	5,333,200	
Goose Bay Operation	<u>49,072,060</u>	
		201,350,394
		pounds
		100,675.2 tons

MARINE WORKS BRANCH

Responsibilities: Establishment and maintenance of marine aids to navigation in the Athabasca-Mackenzie water route and in the Western Arctic, Hudson Strait, Hudson Bay, and Frobisher Bay areas.

Long-term Plans

Maintenance, operation, expansion or reduction of marine aids to keep pace with the requirements of shipping. Participation in the Interdepartmental Engineering Committee co-ordinating activities of government departments in relation to the Athabasca-Mackenzie water route.

Review of 1966 Operations

Aids to navigation in the Athabasca-Mackenzie waterway were maintained throughout the season. After the initial placing of the aids, a programme of improvement was commenced. Commitments made to shipping interests regarding additional buoyage and range markers, as well as some lighted aids, were completed by the end of the season. A new haulout was completed near Fort Providence for safe wintering of ships. A site was prepared at the Town of Hay River for a new Agency complex.

In the Eastern Arctic, new aids as required were established to supplement those already in service. New aids installed in the shipping routes included 3 new radio beacons, several new towers for radar reflectors, new buoys, and new range lights.

Plans for 1967

A new Agency building is programmed for Hay River at a cost of \$150,000 approximately. General construction and the operations budget for the Hay River Agency amount to an additional \$100,000.

The operating and capital budgets in the Eastern Arctic and Western Arctic north of the Mackenzie Delta are included in the budgets of Quebec and Victoria Marine Agencies respectively. No separate breakdown is made. There are no new major aids installations planned for these areas.

**UNEMPLOYMENT INSURANCE
COMMISSION**

UNEMPLOYMENT INSURANCE COMMISSION

Responsibilities: Administration of the Unemployment Insurance Act (excluding the operation of the National Employment Service) through the Commission's local office in Prince George which handles the Yukon Territory, and its local office in Edmonton which handles the Northwest Territories.

Long-term Plans

Study of the problems of applying unemployment insurance in a satisfactory manner to workers in remote areas.

Review of 1966 Operations

The Commission's Whitehorse local office was closed 30 September, and its operations transferred to the Prince George local office. Whitehorse handled 908 claims for unemployment insurance and paid out a total of \$162,198 in benefits. Agents acting on behalf of the Commission are located at Dawson in the Yukon Territory and at Hay River and Inuvik in the Northwest Territories. The agent at Dawson took 37 claims and at Hay River handled 50 claims. No claims were taken by the agent at Inuvik.

Plans for 1967

The continued normal operation of the Unemployment Insurance Service already in existence. An agent was appointed at Whitehorse on 17 January, 1967 to take claims for benefit on behalf of the Commission.

APPENDICES

TREASURY OFFICEINDIAN AFFAIRS AND NORTHERN DEVELOPMENTRevenue and Expenditures in the Northwest Territoriesand the Yukon TerritoryFiscal Year 1965 - 66

<u>Department</u>	<u>Northwest Territories</u>		<u>Yukon Territory</u>	
	<u>Revenue</u>	<u>Expenditures</u>	<u>Revenue</u>	<u>Expenditures</u>
Agriculture	441	51,147	4,527	137,273
Canada Emergency Measure	-	4,345	-	5,528
Chief Electoral Officer	200	60,677	200	15,389
Citizenship and Immigration	-	-	-	9,926
Defence Production	-	-	-	1,305
Energy, Mines & Resources	870	795,489	3,599	268,329
Finance	-	7,629,984	-	1,632,233
Fisheries	12,562	258,556	5,138	29,477
Indian Affairs	-	1,392,132	-	1,074,700
Northern Development	8,866,061	22,449,568	413,129	8,059,776

<u>Department</u>	<u>Northwest Territories</u>		<u>Yukon Territory</u>	
	<u>Revenue</u>	<u>Expenditures</u>	<u>Revenue</u>	<u>Expenditures</u>
Justice	17,180	188,188	27,787	187,870
Labour	-	113,894	-	332,093
National Defence	-	2,006,417	-	1,889,853
National Employment	-	-	-	43,670
National Health & Welfare	688,222	2,419,436	575,392	1,236,176
National Revenue	-	-	906,198	251,760
Northern Canada Power	3,852,635	6,903,579	985,115	230,596
Post Office	150,183	1,062,115	167,992	1,032,293
Public Works	154,017	1,036,470	695,153	8,926,693
R.C.M.P.	567,231	1,850,030	132,460	656,771
Trade & Commerce	1,769	1,445	2,090	2,033
Transport	1,082,515	9,346,807	121,571	1,736,759
Unemployment Insurance	-	-	-	17,790
Veterans Affairs	-	200	-	4,072
	<u>\$15,393,886</u>	<u>\$57,570,479</u>	<u>\$4,040,351</u>	<u>\$27,782,365</u>

GOVERNMENT EMPLOYEES IN THE NORTHWEST TERRITORIES

DEPARTMENT OR AGENCY	<u>NUMBER OF EMPLOYEES</u>				
	Full Time	Seas- onal	Part Time	Total	Change from 1965
Agriculture	11	8	10	29	-3
Canadian Broadcasting	39	-	10	49	+9
Crown Assets Disp. Corp.	-	-	3	3	0
<u>Energy, Mines & Resources</u>					
Geographical Branch	-	28	-	28	+2
Geological Branch	4	67	7	78	-22
Marine Sciences Branch	-	47	-	47	-
Observatories Branch	8	12	9	29	+4
Polar Continental Shelf Project	-	97	4	101	-21
Surveys & Mapping Branch	-	29	51	80	-23
Total	<u>12</u>	<u>280</u>	<u>71</u>	<u>363</u>	<u>-60</u>
Fisheries	14	19	9	42	-21
Forestry & Rural Dev.	-	12	-	12	+7
<u>Department of Indian Affairs & Northern Development</u>					
Indian Affairs Branch	37	4	-	41	-22*
National Parks Service	1	-	-	1	-1
Canadian Wildlife Service	5	19	6	30	-6
Yukon Commissioner	35	13	9	57	+5
N.W.T. Commissioner	92*	-	-	92	+63
Arctic Administrator	353*	-	-	353	+27
Mackenzie Administrator	694	195	32	921	-9
Resource & Development	23	1	10	34	+13
Northern Research	5	6	6	17	-7
Total	<u>1,245</u>	<u>238</u>	<u>63</u>	<u>1,546</u>	<u>+63</u>
Justice	20	-	-	20	+2
Manpower	8	-	-	8	-
National Defence	765	10	27	802	-17
Health & Welfare	377	6	2	385	+66
National Museum	-	10	14	24	+6

AND THE YUKON TERRITORY

LOCATION OF FULL-TIME EMPLOYEES

Q. E. Isl.	Northwest Territories		Mack- enzie	Yukon	TOTAL	REMARKS
	Rest of Frankl.	Kee- watin				
-	-	-	4	7	11	
-	8	-	19	12	39	
-	-	-	-	-	-	
-	-	-	-	-	-	
-	-	-	2	2	4	
-	-	-	-	-	-	1965 Figure
3	-	2	3	-	8	
-	-	-	-	-	-	
-	-	-	-	-	-	
-	-	-	11	3	14	
-	-	-	-	-	-	
-	-	-	-	37	37	Transfer to Admin *Mackenzie
-	-	-	1	-	1	
-	-	-	4	1	5	
-	-	-	-	35	35	
-	1	-	91	-	92	*Establishment
2	198	153*	-	-	353	Figure,*Includes
-	30	-	664	-	694	Churchill
-	-	-	9	14	23	
-	-	-	5	-	5	
-	-	-	8	12	20	
-	-	-	-	8	8	
171	36	-	191	367	765	
-	74	26	130	147	377	
-	-	-	-	-	-	

DEPARTMENT	<u>NUMBER OF EMPLOYEES</u>				
OR					
AGENCY	Full Time	Seas- onal	Part Time	Total	Change from 1965
<u>National Research Council</u>					
Aeronautical	-	9	-	9	-
Building Research	-	5	-	5	-
Space Research	<u>240*</u>	-	-	<u>240</u>	-
Total	<u>240</u>	<u>14</u>	<u>-</u>	<u>254</u>	<u>-</u>
<u>National Revenue</u>					
Customs & Excise	15	2	-	17	-
Taxation	<u>9</u>	-	-	<u>9</u>	<u>+1</u>
Total	<u>224</u>	<u>2</u>	<u>-</u>	<u>26</u>	<u>+1</u>
Northern Canada Power	165	-	183	348	+56
Northern Transportation	7	378	226	611	-123
Post Office	91*	-	11	102	+16
Public Works	341	701	72	1,114	-
R.C.M.P.	180	-	50	230	+52
<u>Transport</u>					
Air Services	592	89	206	887	+47
Marine Services	<u>8</u>	<u>1,098</u>	-	<u>1,106</u>	<u>-113</u>
Total	<u>600</u>	<u>1,187</u>	<u>206</u>	<u>1,993</u>	<u>-66</u>
Grand Total	<u>4,141</u>	<u>2,863</u>	<u>957</u>	<u>7,961</u>	
Change from 1965	<u>+287</u>	<u>+306</u>	<u>-599</u>	<u>-6</u>	

LOCATION OF FULL-TIME EMPLOYEES

Q. E. Isl.	<u>Northwest Territories</u>		Mack- enzie	Yukon	Total	REMARKS
	Rest of Frankl.	Kee- watin				
-	-	-	-	-	-	
-	-	-	-	-	-	
-	-	-	-	-	-	*Includes Churchill
-	-	-	-	-	-	
-	-	-	-	15	15	
-	-	-	-	9	9	
-	32	-	109	24	165	
-	-	-	7	-	7	
6	10	6	31	38	91	*13 Work for other Depts
-	-	-	28	313	341	
4	35	9	77	55	180	
58	143	79	206	106	592	
-	-	-	4	-	4	
<u>244</u>	<u>567</u>	<u>275</u>	<u>1,604</u>	<u>1,205</u>	<u>3,895</u>	
-13	+115	-26	+198	-233	+41	

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